

COLLABORATIVE RESEARCH SUPPORT PROGRAM ON INTAKE AND FUNCTION

Seventh Quarterly Report
(March 1 to May 31, 1983)

Functional Implications of Malnutrition (CRSP)

Project No. 931-1309

During this period, March 1 to May 31, 1983, Nutrition CRSP activities have centered on the completion of preliminary work for Phase I and the conclusion of design plans for Phase II. In the field, staff recruitment and training has been carried out, pilot instruments refined, procedures tested, and demographic and other data collected in the communities. In order to prepare for the final design decisions, each of the projects completed the collection of census data on households in the study communities. Pilot test results and demographic survey data enabled representatives of the projects and Management to resolve remaining design problems. At the conclusion of the group meeting in May, a report was prepared for submission to the External Evaluation Panel and AID.

Completion of Preliminary Data Collections and Pilot Testing of Instruments

During this quarter, each of the projects in Kenya, Egypt, and Mexico was involved in the pretesting and refining of instruments and methods, in completing collections of preliminary data, and in training personnel. (The reports of each of the projects attached here discuss their work in more detail.) Under the direction of Management, demographic data on household composition by age of parents and children were collected at each field site. These data were important for reaching decisions on the appropriate sampling frame. Data were also collected on the relation of intake to socio-economic background of families in order to provide information on the apparent variability of intake in relation to household characteristics. The projects also completed the pilot testing of methods and instruments in the following areas: the feasibility of measuring breast milk intake, the variability of food intake, comparisons of observational and recall methods for recording activities, testing methods for measuring anthropometrics and resting metabolic rates, and the recording of energy use in activity. The results of these pilot tests provided important information in determining the feasibility of procedures for Phase II.

Data collected during this period were transferred from the field sites to computer centers overseas, to project institutions in the U.S., and finally to Management in Berkeley. This process of data collection and transfer enabled data management teams throughout the CRSP to implement plans formulated earlier and to test the efficiency of the process of transferring data from field to the U.S. The purpose of this transfer was therefore dual: (a) to utilize data collected in the field for design decisions, and (b) to pilot test the process of transferring data before the start of Phase II. From the latter point of view, the data transfer was especially productive. After initial problems concerning coding, documentation, and coordination between data management teams, and university computer centers, communication problems were successfully resolved and, by the close of this period, the system was operating efficiently and smoothly.

Completion of Design for Phase II

With the results of Phase I field work and data collections, the group of U.S. Principal Investigators met with the Management Entity from May 17 to 24 in Berkeley to resolve remaining design questions and to prepare the report to be sent to the External Evaluation Panel. The minutes of that meeting are attached. The meeting was highly successful in utilizing the field experience of the projects to focus attention on high priority questions, target subjects, and to prepare a cohesive design. During the meeting, the group reached consensus on principal hypotheses to be tested, on methods to be used, on the selection of core households and target subjects, and on sampling plans.

During the meeting, project Principal Investigators drafted statements on principal hypotheses and research methods. Based on their drafts, members of the Management Entity--Program Administrator Doris Calloway, Deputy Director Judith Balderston, and Consultant George Beaton--completed the writing and editing of the report, incorporating additional material on the design. The report has been separately forwarded to AID for circulation and for transmittal to the External Evaluation Panel members.

In order to complete the design, protocols and data-capture instruments have also been prepared. In some cases, these instruments are identical across projects. For others, where cultural conditions require modification, different but comparable survey instruments are being prepared for each project. The manual, including all data-capture instruments and methods, will be circulated separately.

Data Management and Analysis

The data management and analysis team at Berkeley has been strengthened with the involvement of several eminent members of the Berkeley faculty. Professors Leo Breiman, Juliet Shaffer, Lucien Le Cam, and Elizabeth Scott have met with the Deputy Program Director to discuss analytical strategies for the CRSP. Judith Balderston, the Deputy Director, addressed a seminar of faculty and students in the Statistics Department, and from that meeting a number of very able students expressed interest in working with the CRSP. Drs. Breiman and Shaffer have continued to participate on a regular basis with Management and will supervise the work of three advanced graduate students in Statistics who will work as research assistants on all phases of data management and analysis. We are very fortunate to have the interest and enthusiasm of this group as well as of Berkeley faculty members in other departments. Professor Ronald Lee of the Demography Group and Economics Department at Berkeley has consulted on sampling design and an advanced student in demography has assisted us in analysis of demographic data. Professor Alan Wilson of the School of Education, who has expertise in analysis of large systems, has prepared a series of short papers on methods for estimating measurement effort in home diets, on analysis of multiple independent samples, and other methodological problems. We shall

circulate these papers shortly.

Management Entity Administrative Activities

In addition to the great variety of research responsibilities relating to the collaborative design work and data collection, the Management Entity in Berkeley continues to play a major role in the central administration of the CRSP.

Additional funding authorization of \$2,900,000, effective 12/1/82, was received from AID in April. Updated budgets for the revised Period 3 (4/1/83 - 9/30/84) were received from project institutions and amendments increasing allocations to projects were prepared.

The subcontract agreement with Thomas Cook, Inc. for transportation and related costs of CRSP travellers was extended for another year through 3/31/84. The subcontract agreement with the University of Toronto for the consultant services of Dr. George Beaton was extended for another year through 6/30/84.

A subcontract agreement was executed with the firm of Deloitte, Haskins and Sells to provide for audit of non-U.S. institutional CRSP collaborators for the period 9/1/81 - 2/28/83. Audits of Egypt and Mexico project institutions are reported to be near completion and a report is expected in July. (The Kenya project is not included in the audit for this period since it had no significant expenditures at non-U.S. institutions due to delays in executing the subcontract agreement between UCLA and the University of Nairobi.)

Materials relating to Human Subjects clearances at project institutions were solicited by Management and submitted to the Berkeley Committee for the Protection of Human Subjects for review at its June meeting. It is anticipated that the Berkeley Committee will review updated Phase II clearances at its September meeting.

Management has continued to review requests from projects for equipment authorization. Special attention during this period was given to coordination of equipment across projects consonant with design decisions and to expediting the authorization process by soliciting from projects complete lists of their anticipated equipment needs.

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Minutes of the Meeting of Nutrition CRSP Representatives

Berkeley, May 17 to 24, 1983

Attending: Principal Investigators: Lindsay Allen, Robin Gorsky,
Gail Harrison, Norge Jerome, Avanelle Kirksey,
Charlotte Neumann, Gretel Peltó

Management Entity: Doris Calloway, Judith Balderston,
George Beaton

The purpose of this meeting was the discussion of research design for Phase II and the formulation of the report to be sent to the External Evaluation Panel and AID. Therefore, the meeting agenda was completely taken up with the review of pilot test results, the discussion of preliminary data, of demographic survey results, and of design plans. The report, produced at the conclusion of the meeting and circulated separately, provides all of the specifics of design agreed upon by the participants at this meeting.

There was also brief discussion of publications agreements among participants in the CRSP. There was no conclusive agreement about the appropriate form of these agreements since intra-project agreements will have to be completed before inter-project agreements can be designed.

The following topics were discussed during the course of the meeting.

The Infant as a Target Subject in the Core: There was considerable discussion of how infants can be included as target subjects. Pilot testing of breast milk quantity has not convinced investigators of the feasibility of doing hourly weighings or test weighings. (Deuterium weighing, which has been undertaken in other research projects, was discussed but was rejected as too invasive.) Since, without infant's intake, the intake-function relationship which is central to the CRSP would be missing, it was determined that instead of the direct intake-function relationship for the infant, the condition of the infant would be considered as an outcome of mother's intake. The infant's growth, morbidity, and psychological development would be viewed as the results of mother's intake and her specific child care activities.

The mother will be followed during the last two trimesters of pregnancy and during the first six months of lactation. Maternal intake and morbidity during pregnancy will be hypothesized to be related to infant morbidity and endowment at birth. Maternal intake during the infant's first six months will be hypothesized to affect infant morbidity and growth and development via two pathways-- mother's milk supply, and mother's specific activities for child-

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care and family hygiene. The relationship of maternal intake to immune transfer during pregnancy and during the infant's first six months (from colostrum and breast milk) will also be studied.

Other Target Subjects: The group discussed at length the inclusion of a pre-school child and finally determined that the year between 18 and 30 months is crucially important from both the standpoint of morbidity and of psychological development. It is also believed that the mother's influence on the child is more important during this period than at other later times. Therefore, the toddler's intake and the mother's intake will both be viewed as affecting the child's development and health during this period.

It was also decided that the time of school-starting age is of importance both to the child and to the family. Therefore the decision was made to include the child for one year between 7 and 9 years.

Having decided that these three ages of children are the target subjects for the CRSP, it was also determined that both mothers and fathers of the children would complete the target group. In those cases where fathers migrate frequently for work, households will be included and father's intake recorded when he is present.

Target subjects are therefore to be: lead male, lead female, infant up to six months, toddler between 18 and 30 months, and school-age child between 7 and 8.99 years,

The sampling frame was determined using demographic data for each of the projects. Although birth intervals were not present in the data collected, it was possible to examine age intervals of present members in households and to infer roughly from the ages of potential subjects in each community. It was decided, after considerable discussion that women in the first trimester of pregnancy or potentially pregnant women would be high priority target subjects during the first year. Households with high priority women would be included at the beginning of the first year and would be dropped at the end of that year, if the woman was not then pregnant and did not have one of the other target-age children. Additional households will also be chosen for the presence of the toddler and/or the school-age child. (For full treatment of the sampling scheme see the report of the May meeting.) It was decided that there should be at least 100 subjects of each type in the study.

Functions to be included: A great deal of the group discussion concerned which functions to include. The External Evaluation Panel had recommended that the CRSP design should concentrate in the first year on morbidity and psychological function and the group agreed that these two functions should definitely be included in the first year design. Some members also urged that activity should be studied,

either as time-use patterns or as energy-use for specific activities. Because of difficulties in observing activities, and because of the unreliability of recall of time-use, representatives of the three projects could not agree on appropriate and feasible methods to be included as core in all communities. It was therefore decided that for the first year of Phase II, there will be separate investigations of activity via case studies which will be carried out independently in the three communities. These case studies will follow the suggestion of one of the Evaluation Panel members, Richard Adams, who recommended that the projects be "turned loose" during the first year in order to learn more about life in each of the communities. It was agreed that this would make an important and original contribution to the field. The case study approach was adopted by the group for year 1 with results of case studies, which would start immediately, to be reported by April 1, 1984. The case studies will be conducted in households separate from those included in the core. There will be at least 20 families in each place. Qualitative and quantitative collections of information on households will be conducted in greater depth than in the households of the core.

It was also decided that specific activities for child-care or for family hygiene should be included since they influence morbidity and behavioral outcomes.

Performance capacity was discussed and it was recognized that for the study subjects not enough is known about the relationship of $VO_2\text{Max}$ to work capacity. Since we cannot measure production by the linking of food intake to work capacity to work quality to work amount, we cannot include work capacity in the present design. It was decided rather that work capacity would be studied during year 1 of Phase II.

The frequency of all measurements was discussed in detail. Results of these discussions appear in the report.

Each of the Principal Investigators was assigned a set of tasks for writing methods and hypotheses for the report. At first, small groups were assigned topics and then within each group one person was made responsible for writing the section of the report. The report submitted to AID contains these sections.

A discussion at lunch with four members of the Berkeley Statistics Department was very fruitful. Professors Leo Breiman, Lucien Le Cam, Elizabeth Scott, and Juliet Shaffer attended. There was a lengthy discussion on the advisability of stratification versus random sampling of households. It was agreed that if stratification is to be done, it should not be done on the basis of any variable that is an outcome of intake. Since it is difficult to measure intake in advance of the entry of households into the study, we will need to stratify, if at all,

on a measure that is closely related to intake but not an outcome of it. It was also recommended that we take effective measures to prevent drop-out because of the short duration of the study and the impossibility of replacing subjects.

Other topics discussed fully were seasonal differences among projects, including community measurements for the assessment of the water supply over seasons. Seasons will be taken into account at the end of the study but the sampling scheme will not be based on seasons.

After assignments were carried out by each of the investigators present, drafts were given to the Management Entity for editing and integrating into the report. It was agreed that George Beaton and Judith Balderston would draft additional sections of the report on sampling design, data management, analysis, and introductory material. Doris Calloway, George Beaton, and Judith Balderston subsequently carried out these tasks and forwarded the completed report to AID in mid-June.

Time-table:

The schedule of activities for the future is as follows:

Case studies begin July 1

Phase II data collection begins October 1.

Data for the first quarter of Phase II will be in Berkeley before February 1. (Data will be sent to Berkeley on tape according to instructions to be sent to the data managers.)

Meeting on April 1 with case study and data analysis results.

Quarterly Report
Egypt Project
Nutrition CRSP
University of Arizona
Seventh Quarter 1983 (March 15 - June 15, 1983)

I. COUNTRY PROJECT STATUS

1. Travel
2. Negotiations with Counterpart Institutions
3. Recruitment of Staff for Project
4. Research Activities
5. Data Management/ Data Analysis
6. Administration

II. INTERPROJECT ACTIVITIES

III. PLANS FOR NEXT QUARTER

enclosures: Trip Reports: Harrison
Wachs
Kirksey
Borschel

I. COUNTRY PROJECT STATUS

1. Travel

Dr. Farouk M. Shaheen (Nutrition Institute) traveled to the U.S., May 18 - June 26, for the following purposes:

- 1) Training at the Fels Research Institute, Yellow Springs, Ohio, in anthropometry, quality control procedures, and other relevant measures.
- 2) Consultation in Kansas in the area of data management.
- 3) Training at Arizona in Dubowitz assessment of gestational age, and consultation on core morbidity protocols.

Drs. Avanelle Kirksey and Marlene Borschel (Purdue) completed a trip to Egypt in the beginning of this quarter. (Trip reports attached)

Dr. Gail Harrison (Arizona) traveled to Egypt April 20 - May 15. Activities and accomplishments are summarized in the trip report. (enclosed)

Dr. Ted Wachs (Purdue) traveled to Egypt May 8 -17 to work with Egyptian scientists on procedures for cognitive measurements. The details are in Dr. Wachs' trip report which is enclosed.

The three U.S. Principal Investigators participated in the CRSP U.S. PI's meeting in Berkeley in May to review Phase I research and finalize the research design for Phase II. Dates were May 16-23 (Dr. Jerome), May 16-24 (Dr. Kirksey), and May 16-22 (Dr. Harrison).

2. Negotiations with Counterpart Institutions

Kansas and Arizona received verbal approval of their Year 3 budgets from Purdue. All three last-tier subcontractors (Arizona, Kansas, Nutrition Institute) await amended subcontracts and funding for this budget period (April 1, 1983 - Sept. 30, 1984).

3. Recruitment of Staff for Project

A. Egypt

Involvement and responsibilities of staff were clarified.

Role and job expectations for Project Field Coordinator were clarified.

B. University of Arizona

Ms. Jean Harrison, Research Assistant, resigned and Ms. Linda Hautkooper has been hired in this position. She will serve as administrative coordinator for Arizona activities (50% time). She may be contacted at (602) 626-6468.

C. University of Kansas

Dr. Jerome, Judi Ricci, and other Community Nutrition Division staff members interviewed candidates for the position of Administrative Assistant (50% Nutrition CRSP). They succeeded in recruiting Ms. Dawn Penrose who assumed her new position on April 18, 1983. She may be contacted at (913) 588-2792.

Dr. Jerome designed a job description for a Post-Doctoral Research Associate to work full-time in the field on the Egypt Nutrition CRSP. Kansas is advertising for the position in the Anthropology Newsletter and Medical Anthropology Newsletter.

4. Research Activities

A. Egypt

1. Food Intake Studies: Dr. Wafaa Moussa supervised data collection on food intake on a sample of 60 target households (H.H.). Since 33 H.H.'s had been previously studied in October, only 27 additional H.H.'s were included in this survey. The final sample included 16 H.H.'s of high socioeconomic status (SES), 28 H.H.'s of intermediate SES and 16 H.H.'s of low SES. Designation of H.H. to SES had been in Kansas. Field work started on May 10th and continued for 3 working days.

Refresher training sessions were held for 16 dieticians in preparation for field data collection and final data analysis. In addition, an assessment of the availability of lead males at home for dietary intake studies was made. These data were tabulated and forwarded to Kansas.

In May the feasibility of using the Food Inventory Method was studied using consenting H.H.'s from the 27 surveyed in April. Of these, 5 H.H.'s refused to participate and were replaced by H.H.'s studied in October. This method was time consuming, tedious, and unacceptable to the community.

2. Anthropometric: Plans were discussed with Dr. Gail Harrison during her visit from April 21 - May 15 for methodologies to be used for anthropometric measurements.

3. Cognitive Development: Dr. Zeinab Bishry and Dr. Feisal Yunis worked with Ted Wachs during his visit of May 5. Two manuals were developed for the observation of environmental interaction. The manuals were translated into Arabic by Dr. Bishry and field workers were given training in their use. It was determined that the dieticians under the supervision of Dr. Wafaa and Dr. Bishry were to be used to collect these data. Initial training of the dieticians began in the out-patient clinic of the Nutrition Institute and then advanced to Kalama Village for on site application.

The cognitive tests were translated into Arabic under Dr. Feisal's supervision. In addition, translation of the Achenbach child behaviour check list and temperature tests were undertaken by Dr. Bishry.

After pilot testing of the infant temperament questionnaire for 4-8 month old infants and the toddler temperament scale of 1-3 year old children, modifications were made appropriate to the Egyptian culture.

Dr. Frances Horowitz visited the Nutrition Institute during the first week of June. Arrangements were made for her to begin training of Dr. Bishry to use the K-Brazelton using infants from local private and public hospital nurseries.

4. Morbidity: Thirteen physicians, newly appointed to the Nutrition Institute were trained in morbidity assessment by Dr. Farouk Shaheen with participation from Dr. Amin Said. The morbidity questionnaire was modified after discussion with Dr. Harrison. The above mentioned 60 H.H.'s were included in a pilot morbidity study in which a 7 day morbidity recall was undertaken once each week for 4 weeks. Dr. Shaheen initiated the first two weeks of the study before he left for training at the Fels Institute and for consultation with U.S. counterparts at their respective universities. The final two weeks of the study were supervised by Dr. Amin K. Said. The morbidity questionnaires and tabulations were forwarded to Kansas.
5. Maternal Performance: Dr. Amin K. Said continued his work in collecting milk samples which were then sent to Purdue University via Dr. Wachs. Dr. Said also initiated a study on feasibility of collecting birth weights and the procedures to be used. He is now completing a report on an infant - weighing procedure to assess food intake. In addition, he was able to

collect statistical information from official records at the Kalama Health Center regarding the number of births and deaths in the first year of life in Kalama Village from 1982 until the present.

A preliminary questionnaire for data collection of reproduction was designed in cooperation with Drs. Avenelle Kirksey, Mohamed Hussein and June Wolgemuth.

6. Socio-Demographic: Dr. Amin Abdou continued his work on modifying and testing of the socio-demographic questionnaire. Field workers were trained and pilot testing was begun in Kalama. A "back translation" was completed of the Arabic version of the questionnaire.
7. Immunology: Arrangements were made by Drs. Esmat El-Ekkladious and June Wolgemuth for the training in immunological technics at NAMRUE -3 for two members of the Nutrition Institute staff: Dr. Mervat El Hussiny and Dr. Nadia Megally. Approval of this training was granted by the Director of Research, Dr. A. Ansari after consultation with the commanding officer, Capt. Craig Wallace. The nature and procedure for this training were finalized with Dr. Mostafa Mansour. Training was completed by the end of May. Dr. Megally was trained in cell-mediated immunological techniques while Dr. El-Hussiny was trained in enzyme immunoassay. The latter will receive additional training at the University of Arizona in the laboratory of Dr. Ronald Watson. Funding for this 3 month period of training was received from an AID grant (Non-CRSP).
8. Cultural: Dr. Zeineb Shaheen conducted 20 "mini-ethnographics" - limited case studies found on specific areas including child care, food exchange, illness tea drinking, and flow of household work.

B. University of Arizona

A second draft of a core anthropometry manual was developed and circulated. Morbidity protocols were developed for pilot testing; after pilot studies and experience with data generated, work was begun on revision of protocols for physical exams and morbidity recall. Criteria for illness severity were developed. Dr. Mervat El-Hussiny arrived for three months of training in immunology with Dr. Watson. Drs. Ritenbaugh, Harrison, and Shaheen were trained in Dubowitz assessment.

Hair samples were collected from 39 preschool children in the study community for initial analysis of zinc status.

C. University of Kansas

Dr. Jerome reviewed the report forms and data from the Kalama census and redesigned the Sociodemographic Survey instrument accordingly. The new survey instrument now has two different census sheets on page 1 - Forms A and B - to reduce enumerator-recorder error. Dr. Jerome also developed a manual for the Sociodemographic Survey.

Dr. Jerome and Judi Ricci designed a proposed food coding system for the Egypt project.

Based on a review of the literature on field research methodology for the Social sciences, Carol Field prepared a supplement to the Nutrition CRSP Manual of Instructions. Subjects covered were: Field Testing the Survey Instrument, Determining Interviewer/Recorder Accuracy and Reliability, and Completing the Field Record.

Dr. Jerome supervised Judi Ricci in the analysis and evaluation of time use and body position data and in the production of the report, "Time Use and Body Position in Kalama, Egypt: Results of a Preliminary Study."

Dr. Jerome and Judi Ricci revised the field strategy of gathering data on time use in Kalama via:

1. The visual presentation of an individual's body positions during activity. Judi Ricci implemented the idea.
2. An improved Activity Record for the recording of observational data and the first draft of a manual for the Activity Record.

Under Dr. Jerome's supervision, Judi Ricci conducted a computer search for hand-held computers (cost approximately \$100.00) to be used for collecting observational time use data in Kalama. The high cost of the computer systems, as well as the enormous amount of time estimated to train the field workers in using this method were prohibitive, despite its value as an observational tool.

Kansas submitted five non-core research project proposals to be incorporated into the Phase II research plans. The budget request for these projects totals \$25,000.00.

D. Purdue University

Dr. Kirksey

1. Six data collection forms for reproduction/lactation were prepared and adaptability of the forms for data processing was discussed with a statistician. Modification of the forms will be discussed with Dr. Amin Said, Egyptian Senior Scientist, when he visits the U.S. in July.
2. Experimentation continues with laboratory methodologies and preparation of protocols for measurements of hemoglobin, hemocrit, and serum ferritin and also for measurements of urinary ketones, glucose, and protein.
3. Milk samples obtained from 30 lactating women in the village of Kalama, Egypt were transported in dry ice to the U.S. (Purdue University). Samples were analyzed for total lipid, total protein, zinc, vitamin B-6, folacin, and vitamin C. Experimentation is on-going to compare variability in lipid levels which may be related to different methods of milk sample collection and lipid analysis.

Dr. Ismail

1. A protocol was revised for the measurement of basal/resting metabolic rate using a Beckman metabolic cart.
2. A noncore research protocol was developed for the assessment of work capacity based on a bicycle ergometer instead of a treadmill and using a Beckman metabolic cart.

Dr. Wachs

1. A research proposal for Cognitive Development was revised according to the suggestions of the External Evaluating Panel.
2. Dr. Wachs' trip report gives information about the development of procedures and protocols for cognitive measurements.

Other

Noncore research proposals were developed for:

- 1) Measurement of milk volume and nutrient intake of infants/toddlers
- 2) Measurement of work capacity/work performance of adult males and females and of children
- 3) Assessments of characteristics of infants home environment which will affect cognitive outcome measures
- 4) Assessment of infant recognition memory in relation to food intake
- 5) Investigation of inbreeding characteristics of village population

5. Data Management/ Data Analysis

In Egypt, Dr. Mohamed Hussein was consulted by Dr. Amin Said and Dr. Gail Harrison in order to organize data management procedures, Drs. Farouk Ghoneim and June Wolgemuth will coordinate management organization, and flow of data from the Nutrition Institute to Alexandria and the U.S.A.

At Kansas, Dr. Jerome, Bev Beaton, and Ruth Hassanein redesigned the project's occupational coding system for stratifying households. They also designed a system of collecting data on 60 representative households to finalize Phase I research.

Ruth Hussanein consulted with principal investigators at the University of Kansas and Arizona, and with the Management Entity at Berkeley. She also supervised Bev Beaton's work.

Bev Beaton wrote the following 27 programs for analyzing census data, food intake, and anthropometry data:

- #3 - Classification of children into age groups 0-2 7-10 12-15 (LM or LF present)
- #4 - Classification of children into age groups 0-3 4-6 7-13 (LM or LF present)
- #5 - Classification of children into age groups 0-2 7-10 12-15 by maternal age groups (LF present)
- #6 - Classification of children into age groups 0-3 4-6 7-13 by maternal age groups (LF present)

- #7 - Classification of children into age groups 0-2 7-10 12-15 (LM and LF present)
- #8 - Classification of children into age groups 0-3 4-6 7-13 (LM and LF present)
- #9 - Classification of children into age groups 0-2 7-10 12-15 by maternal age groups (LM and LF present)
- #10 - Classification of children into age groups 0-3 4-6 7-13 by maternal age groups (LM and LF present)
- #11 - Average age of lead male and lead female by age group of children (0-2 7-10 12-15) (LM and LF present)
- #12 - Average age of lead male and lead female by age group of children (0-3 4-6 7-13) (LM and LF present)
- #13 - Average age of lead male and lead female by age group of children (0-2 7-10) (LM and LF present)
- #14 - Correlation between occupation and years of school of the lead male
- #15 - Frequency of education for the lead male's occupation
- #16 - Listing of target households and lead male's occupation
- #17 - Listing of target households and lead male's occupation by occupation
- #18 - Listing of census, anthropometric and food intake data for 34 target households. Sent to Berkeley on tape.
- #19 - SES vs. Family size by maternal age
- #20 - SES vs. Family size (0-1 2-3 4+) by maternal age
- #21 - % RDA for family member by SES groups
- #22 - Analysis on all food intake data - comparing 3 days of intake for each target individual
- #23 - Analysis on food intake data of target households - comparing 3 days of intake for each target individual
- #24 - Two-way ANOVA comparing food intake (KCAL) and SES, Repeats = target members
- #25 - Two-way ANOVA comparing food intake (%RDA) and SES, Repeats = target members
- #26 - Summary stats, frequency distributions and correlation matrix on food intake variables by target members
- #27 - One-way ANOVA for KCAL by target members
- #28 - Anthropometric table - AGE vs. SES, variable Height
- #29 - Anthropometric table - AGE vs. SES, variable Weight

A filing system was set up for the programs written.

Bev Beaton and Carol Field keypunched, verified, and corrected 3 sets of data:

1. Anthropometric data on 350 households (2064 lines)
2. Food intake data on 27 households (108 lines)
3. Physical assessment data on 40 of 63 households (520 lines)

Census data were corrected, replacing "--" with '00' for years of school; blocks 1, 2, and 3 are completed.

Two tapes were sent to Berkeley:

1. Census, food intake, and anthropometric data on 34 target households
2. All census data

A list of Egypt project descriptors at the household and individual levels were compared to the list submitted by the Mexico project to identify missing and noncongruent data between the two projects.

6. Administration

Plans for noncore research activities were made and a summary forwarded to Berkeley.

Plans for travel of Egyptian senior scientists to the U.S. for specific training activities were made.

Project meetings were begun in Egypt to be held on a weekly or biweekly basis as needed to coordinate research activities of all senior scientists. To date, seven meetings have been held and have been very useful for discussion of problems encountered or anticipated, and to inform all project scientists of area research activities, administrative needs and communications received.

The necessary customs forms and letters were completed and delivered to Four Winds which has been hired to receive and deliver the project vans. Their delivery has been promised for mid-June.

A telex communication system has been rented. Its installation was begun June 15th in the CRSP office.

II. INTERPROJECT ACTIVITIES

All three U.S. Principal Investigators participated in the May 16-24 meeting to finalize Phase II design.

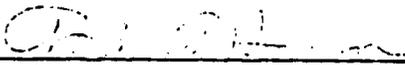
Considerable informal interproject consultation occurred in areas of morbidity, cognition, work performance and immunology.

III. PLANS FOR THE NEXT QUARTER

Plans for the 8th quarter (June 15 - Sept. 15, 1983) can be summarized in terms of completion of Phase I activities and preparation for the start of Phase II. We intend to accomplish:

- (1) Completion of reports of all Phase I studies, and compilation of these in a printed document.
- (2) Focused Ethnographic investigation of local perception and norms relevant to diarrheal and respiratory disease.
- (3) Completion of training and plans for village socio-economic survey, and start of the survey.
- (4) Drafting of all data capture instruments and protocols for core measurements, and agreement among projects and with management on these.
- (5) Project meeting Sept. 6-7 in Cairo to review Phase I and start Phase II, to include all Egyptian senior scientists, the U.S. P.I.'s, U.S. senior scientists as appropriate and other invited guests.
- (6) Plans finalized for all staff training, field logistics, and data flow management for Phase II.
- (7) Renovation of building in village completed for use of project.
- (8) Transfer of Project Representative role from Dr. Harrison to Dr. Kirksey on September 1.

Submitted by



Gail G. Harrison
Project Representative
June 28, 1983

TRIP REPORT
Egypt Project, Nutrition CRSP
April 20 - May 15, 1983
Gail G. Harrison

PURPOSE

The objectives of the trip were as follows:

1. To plan with the Egyptian PI and senior scientists the completion of Phase I and the steps leading to readiness to implement Phase II of the research.
2. To assist in completing pilot studies of morbidity recall methods.
3. To observe and assist in completing and reporting pilot data on food inventory methods, distribution of birthweights, and births and infant deaths in the field community.
4. To familiarize myself with the village field site.
5. To become acquainted with the field staff to be involved in morbidity and anthropometry data collection in Phase II.
6. To review and evaluate the role of the Field Coordinator.
7. To initiate sample collection for the pilot study on zinc status (noncore project approved by SCB 11/82).
8. To ascertain equipment and supply needs and initiate process of acquisition for those items clearly needed.

The objectives of the trip were accomplished.

SCHEDULE

April 20 Left Cincinnati, Ohio
April 21 Arrived in Cairo

Week of April 22-28

Spent one day in Kalama to become familiar with the village site.

Planning meetings with Egyptian PI, senior scientists, and field coordinator regarding morbidity recall pilot survey, other preliminary data needs, plans for food inventory pilot study, allocation of responsibilities among senior staff, role of field coordinator, and general project operations.

Met with all Egyptian CRSP senior scientists at project staff meeting, to bring all up to date on overall CRSP progress and status, and plan for completion of Phase I pilot studies.

Attended 2-day conference on Nutrition and Aging sponsored by the Nutrition Institute (NI) and the Egyptian Nutrition Society.

Met several times with Nutrition Program Director for Catholic Relief Services (CRS) and Egyptian PI to work out plans for interaction of CRSP with major CRS sponsored project.

Week of April 29-May 5

Four days spent in Kalama participating in initiation of morbidity recall pilot study, birthweight pilot study, collection of milk samples for breast milk pilot study and hair samples for zinc pilot study and gathering data on recorded births and infant deaths.

Participated in CRSP Project Meeting, individual meetings with Egyptian senior scientists Drs. Farouk Shaheen, Wafaa Moussa, Amin Said, Daisy Fleita, Ahmad Dakroury, and Rashideh el-Naggar.

Week of May 6-12

Two days in Kalama, as above and observing conduct of food inventory pilot study.

Meetings with Mr. John Wiles (USAID) and Dr. Mamdouh Gabr regarding general progress and plans of the project.

Assisted with calculation and reporting of data for test-weighing pilot study.

Traveled to Alexandria to meet with Dr. Mohammed Hussein Khalil, Egyptian senior scientist in data management, to plan for Phase II.

Met with Field Coordinator several times regarding overall project management and operations.

Met with Dr. Ted Wachs, who arrived 5/8 for a week of training activities in cognitive area.

May 14 - Cairo

Met with Field Coordinator, assisted with preparation of pilot study data and reports.

May 15-16

Travel from Cairo to Berkeley, California for meeting of U.S. Pl's.

ACCOMPLISHMENTS

1. Pilot study on morbidity recall method was planned and begun; initial data were brought to Kansas.
2. Preliminary studies on food inventory and test-weighing were completed during the trip; reports were carried back to U.S. for use in the Berkeley meeting.
3. Data on recorded pregnancies, births and infant deaths in Kalama since 1980 were extracted and summarized.
4. Pilot studies on birthweight (accessibility and weights) were initiated; plans were made for continuation until a sufficient number to characterize the distribution of birthweights in the community.

5. Overall project management planning was extensive, including:

- a. Interaction of CRSP with other projects;
- b. Allocation of responsibilities for Phase II;
- c. Role of project field coordinator, (PFC);
- d. Procedures for U.S. scientists to follow in relation to PFC;
- e. Detailed plans for training trips to U.S. for several senior Egyptian scientists;
- f. Tentative plans for fall 1983 schedule, including project meeting in Cairo in September 1983.

6. Hair samples for zinc analyses were collected from 39 preschool children..



Gail G. Harrison

 June 23, 1983

Date

7 June 1983

REPORT OF VISIT TO EGYPT

I arrived in Cairo on Sunday, May 8 and left on Tuesday, May 17. During the time I was there my activities were as follows:

1. Based on preliminary input from Dr. Marion Radke-Yarrow I wrote a preliminary manual for Observation of Social Interactions in School Aged Children. This preliminary draft was discussed with Dr. Zeinab Bishry and then revised. During two afternoons I observed children's interactions in naturalistic settings at various points in Cairo to assess the field utility of the proposed manual. Based on this information, I have given the revised manual back to Dr. Bishry with suggestions for further revision.
2. I met with the four psychologists selected so far by Dr. Faisal Yunnis to discuss the aims and goals of the project. In addition, three days were spent working with the psychologists on procedures for infancy testing. All of the psychologist proved to be intelligent, cooperative, and eager to learn but major amounts of further training are necessary before they can be considered as ready to provide accurate data in this area.
3. One day was spent establishing preliminary reliability with the dieticians trained by Dr. Bishry on measurement of infant parent interaction. In this preliminary attempt at establishing reliability it became obvious that, for certain categories, it was difficult to obtain satisfactory reliability. Dr. Bishry and I have discussed reasons for this and have suggested modifications in our scale, which will be built into further training sessions in an attempt to attain more satisfactory reliability. It should be noted however that on other categories reliability was quickly established and does not appear to be a problem. The major problem seems to center around categories where time sequences are necessary.
4. One morning was spent with Dr. Bishry and Dr. Macalayne Fristoe (a developmental psychologist trained in language assessment who happened to be visiting in Egypt) on approaches to assessing language interactions of mothers' and toddlers. Based on these discussions Dr. Bishry will attempt to develop a specific set of scoring criteria for use in assessing interaction.
5. Several evenings were spent with Dr. Yunnis in terms of establishing measurement procedures for areas such as toy play which have not yet been fully dilienated. Similar amounts of time were spent with Dr. Bishry concerning the utility of behavioral measures designed for assessing adequacy of children's behavioral functioning.

In this last trip one critical problem has become apparent. This is the difficulty of training people while in Egypt, to the standards necessary for research. In training individuals in behavioral measures two critical criteria are necessary. The first are the availability of the people to be trained; the second is the availability of subjects (infants, parents, older children in the age ranges needed and in the time needed). Neither of these criteria are being met in Egypt. In terms of the availability of people to be trained, unfortunately all of our psychologists, as well as key people such as Dr. Bishry and Dr. Feisal are not directly attached to the Nutrition Institute. These individuals have other demands on their time and are available only at selected time periods.

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Their relative unavailability is compounded by the problem of finding suitable subjects to train people on. It is difficult to do this in the village given the amount of time to get out to the village, plus the relative unavailability of transport to and from the village. Therefore, we are forced to depend upon clients who come into the Nutrition Institute. Unfortunately this is an extremely haphazard procedure. On a number of days when I was there when several psychologists were scheduled to be there, very few mothers and babies showed up and none were in the appropriate age range. On other days when few psychologists were available a number of mothers and babies all showed up at the same time. By being all there at the same time, infants were continually falling asleep at times when we could have used them.

The only possible solution I can see to the above problem is to take key people such as Dr. Bishry and Dr. Faisal and train them directly in the states. By training them in the states I would have their undivided time plus we could arrange for subjects in the age ranges needed, when we wished. Therefore, in terms of future training the situation is as follows:

1. In regards to Dr. Bishry, she is scheduled to come to the states in July. We are trying to schedule her to visit New York Medical Center, to be trained in assessment of temperament, University of Kansas, to be trained in administration of the Brazelton and Purdue, to establish interobserver reliability on measures of parent interaction and measures of social interaction in older children. Dr. Bishry will then return to Cairo and train the appropriate people over the time needed. When she has established satisfactory reliabilities for them I would then return to Cairo again to cross-validate her reliability.

In regards to Dr. Faisal, in terms of the Egyptian portion of the grant he is not scheduled to come over to the United States for some time. Therefore, I will be formally requesting permission to utilize a portion of my travel funds to bring Dr. Faisal to the United States in the next month or two. The purpose of this would be to train Dr. Faisal on the various measures of infant assessment we are utilizing, and establish reliability with him on these measures. In addition, we would cross-check reliability on all of the measures for children and adults. Dr. Faisal would then return to Cairo and train his people over the time required. Once he had obtained satisfactory reliability procedures with his personnel on all measures I would then return to Cairo to cross-validate his reliability figures. In the interim, until I can get Dr. Faisal over to the United States, he will be establishing reliability figures with his personnel on tests of children and adults.

It must be stressed that until we get satisfactory reliability figures on research personnel supervised by Drs. Bishry and Faisal, which I can then cross validate, we will not be able to collect either cognitive or behavioral data. Hence, it becomes all the more critical to get key people such as Drs. Bishry and Faisal over here as soon as possible if we are to have any hope at all of establishing satisfactory reliability in time for the desired starting dates.

TRIP REPORT

CAIRO, EGYPT

March 4 - March 27, 1983

NUTRITION CRSP

Neil

Avanelle Kirksey
Principal Investigator, Purdue University

April 25, 1983

This is a report of the activities and accomplishments for Nutrition CRSP resulting from a trip to Cairo, Egypt, March 4 to March 27, 1983. The itinerary is included as Attachment I. The purposes of the trip were:

- 1) to work with Egyptian colleagues in the refinement of protocols and the development of procedures for Reproduction/Lactation;
- 2) to field test the procedures for Reproduction/Lactation;
- 3) to develop procedures for biological fluid measurements and for laboratory quality control; and
- 4) to finalize plans for supplies, equipment and staff needs for implementation of protocols for Reproduction/Lactation and Biological Fluids.

Dr. Marlene Borschel, a post-doctorate in Nutrition at Purdue University and who plans to work in the area of Reproduction/Lactation in the project, accompanied me to Egypt. The research which she completed recently for the Ph.D. degree involved test weighing of large groups of breast-fed infants and the validation of this procedure with formula-fed infants. Dr. Borschel traveled to Egypt for the purpose of meeting and working with the Egyptian scientists particularly in test weighing procedures and to visit the field site for the project. Her contributions were useful and the experiences which she had in Egypt should contribute invaluable to her future input into the project. Her trip report gives further details.

I. Refinement of Protocols for Reproduction/Lactation

A. Milk Volume Intake of Infants

A battery operated K-Tron digital scale, Model DS-1 accurate to 1 g was carried to Egypt for experimental use in the test-weighing of infants. Dr. Amin Said, Egyptian Senior Scientist for Reproduction/Lactation, trained assistants at the Nutrition Institute in the use of the scale. A series of 4 to 6 hour experiments were conducted on several formula-fed infants of women who were out-patients at the Nutrition Institute and who had agreed to participate in the experiment. Direct measurement of formula (weight of bottle and formula before and after a feed) was compared to a) WHO procedure of test-weighing infants (differences in weights of the infant before and after a feed) and b) hourly weight changes of the infant irrespective of feedings. The data (see Attachment II) indicate excellent agreement among the three experimental procedures: direct measurement of formula, WHO procedure for test-weighing and hourly weights of infants. Also, data for infants weighed at 2- and 4-hr intervals were approximately 80% of the WHO procedure for test-weighing. However, the interval weighing procedure has limited usefulness since it can be used only for solely breast-fed or bottle-fed infants whereas test-weighing is useful for milk intake estimates after the introduction of food supplements. For some Egyptian infants, solid foods are offered by 3 mo of age and most infants are fed solid foods by 5 to 6 mo. At this time, test weighing becomes the procedure of choice for estimating the volume of milk intake of infants.

B. Early Information About Newborn Infants

Dr. Amin Said predicts that 25% of the infants born in the village of Kalama will have delayed registration. The family waits until survival outcome of the infant is known before registration is initiated. Dr. Said suggested that a nurse should be appointed to the project to monitor births among villagers participating in Nutrition CRSP in order that information about births can be made available immediately to project workers.

C. Questionnaire Forms for Reproduction/Lactation

Dr. Amin Said, Dr. Marlene Borschel and I collaborated in the development of six forms to be used in collecting data for Reproduction/Lactation (Attachments III A-F). These include:

- Reproduction History
- Lactation/Infant Feeding Practices History
- Pre-Pregnancy Monthly Visits
- Pregnancy Monthly Visits
- Pregnancy Outcome
- Lactation/Infant Feeding

Dr. Said, Dr. Borschel and I traveled to Alexandria to discuss the forms with Dr. Hussein Khalil, Chairman, Dept. Statistics and Senior Scientist for Data Management for the project. Dr. Khalil offered suggestions for some revisions of the forms to facilitate both data collection and recording. These suggestions were incorporated into the forms which are included with this report.

II. To Field Test the Procedures for Reproduction/Lactation

A. Test Weighing

Several home visits were made in the village of Kalama for the purpose of test-weighing infants and collecting milk samples. In the homes which we visited, all infants were breast-fed with the exception of one formula-fed infant. Carrying the electronic scale and milk collecting equipment, we were welcomed into the homes. The scale was easily set-up in the homes for test-weighing. In most cases only one feeding of the infant was measured; however the procedure for test-weighing was described in detail to some of the mothers. Dr. Amin and his assistants at the Nutrition Institute are confident that 12 hr periods of test-weighing can be accomplished with the use of two shifts of field workers. Some possibilities which may allow for test-weighing to be continued for the full 24-hr are as follows:

- 1) a printer added to the electronic scale may enable some mothers to continue test-weighing for the next 12-hr period after the field worker leaves or
- 2) some mothers may spend the night in the project building where a field worker can assist in the test-weighing. If uniformity is observed in the percent of milk volume intake consumed by infants at different ages during the 12-hr night-time interval, a factor can be determined for use in the estimation of milk volume intake for the 12 hr interval. This procedure is reported in the literature and was used to estimate milk volume intakes of some Gambian infants.

The Egyptian infants whom we observed in the village were fed at intervals during the day. However at night some infants may feed intermittently while they sleep with their mothers. In order to test weigh these infants procedures will need to be developed and agreed to by the mother such as the wearing of a brassiere or T-shirt by the mother during the night of test weighing. Pilot work will continue on the development of test weighing procedures and in particular for the 12-hr interval from 7:00 p.m. to 7:00 a.m.

B. Milk Sample Collection

Collection of milk samples was accomplished both by manual expression and with the use of a Loyd-B-Pump, Lopuco, Ltd., manual breast pump. When all milk is expressed from one breast some mothers need reassurance that their baby is not being deprived of needed food. The fat content in milk from

women in the village (Attachment IV) showed considerable variability when obtained from right and left breast and from fore or hind fractions of expressed milk. Work will continue at the Nutrition Institute and at Purdue to determine the procedure which results in a sample most representative of a 24-hr milk collection. Collection of all milk from one breast at mid-day is presently the sampling procedure recommended. Lipid content of milk is the most variable constituent and is the nutrient most likely to be affected by the sampling procedure used.

III. To Develop Procedures for Biological Fluid Measurements and Laboratory Quality Control

A. Biochemical Measurements of Milk and Blood

Several discussions were held with Dr. Ahmad Dakroury, Head of the Department of Nutritional Biochemistry and Metabolism at the Nutrition Institute regarding biochemical measurements of milk and blood. Laboratory facilities at the Institute (space and equipment) are adequate for the measurement of macronutrients in human milk (protein, fat and carbohydrate) and for minerals (Ca, Mg, Na, K, Zn, Fe, Cu and Mn). Dr. Ihab Hegazy, who works with Dr. Dakroury, is experienced in these measurements and can train and supervise the technicians at the Institute. Because of the pervasive problem of anemia in Egypt, Dr. Galal and the scientists at the Institute have plans for major up-grading of the hematology laboratory. Presently the laboratory is equipped for hemoglobin and hematocrit measurements. Initially ferritin measurements can be made at the U.S. Navy Medical Research Unit 3 (NAMRU). Arrangements were made with Dr. Moustafa Mansour, Head of Biochemistry Department at NAMRU, to assist in the training of technicians from the Nutrition Institute in the determination of serum ferritin.

B. Transport of Biological Samples to the U.S.

Casual samples of milk obtained from several women in the village of Kalama were subdivided and duplicate samples were frozen for later transport to Purdue University. Official letters were obtained from the Department of Navy and the American Embassy (Attachment V A,B) to facilitate clearance of the milk samples at U.S. Customs. Frozen milk samples, packed in dry ice in a styrofoam container, remained frozen during the 22-hr flight from Cairo to the U.S. No problems were encountered in clearing U.S. Customs with the samples.

C. Laboratory Quality Control

Results from assays of milk samples to be done at Purdue University will be compared to those obtained from duplicate samples analyzed at the Nutrition Institute in Egypt. Protocols and standards are being developed for laboratory quality control. Inter-laboratory standardization was discussed with Dr. Dakroury. He suggested that the Center for Disease Control in Atlanta is a potential source of control samples (i.e. hemoglobin) for inter-laboratory standardization. This will be explored.

IV. To Finalize Plans for Supplies, Equipment, Space and Staff Needs for Implementation of Protocols for Reproduction/Lactation and Biological Fluids

A. Supplies and Equipment

Several meetings were held with Dr. Amin Said, Senior Scientist for Reproduction/Lactation, to inventory supplies and equipment in the Nutrition Institute and

to plan for supply and equipment needs for future data collection in Reproduction/Lactation. Lists of supply and equipment needs were brought to Purdue for ordering. Whenever possible equipment and supplies will be carried to Egypt as excess baggage by project personnel going to Egypt since this continues to be the most expeditious procedure. Several meetings were held with Dr. Dakroury, Head, Department of Nutritional Biochemistry and Metabolism at the Nutrition Institute to plan for supply and equipment needs for biological fluid measurements during data collection. In particular the needs for hemoglobin, hematocrit and ferritin were outlined and a list was brought to Purdue for ordering.

B. Space

Laboratory space at the Nutrition Institute is adequate for the projected measurements. However, up-grading of the space and some additional equipment is needed for the work of the project. Current plans are to begin up-grading the laboratories for hematology and immunology.

A building, adjacent to the Health Center in the Village of Kalama, is needed to facilitate several aspects of project work. The building is the property of the Ministry of Health and this necessitates that certain official procedures be followed in order that the building can be made available for Nutrition CRSP use. This is being done by Dr. Said. The building requires up-grading for use in lactation studies, work performance, and cognitive testing as well as for use by the field workers and observers as a lounge and to review and tabulate data. Obviously the assignment of this building for project use is very important to present and future work.

C. Staff

Many of the workers in the laboratories at the Nutrition Institute hold doctorate degrees in biochemistry. Dr. Hegazy, a biochemist who works with Dr. Dakroury, has returned recently from one year of study in biochemical methodologies at a Canadian University. These workers have expertise but will require training in the specific methodologies to be used in Nutrition CRSP. Procedures for inter-country laboratory standardization were discussed and will be developed.

Ten physicians who have recently completed work for their degrees in Medicine and who were among the top scholars in their graduating class have agreed to work in the Nutrition Institute and to assist in the village in morbidity and disease screening for the project. These physicians will also assist in the Dubowitz measurement of newborn infants for the assessment of gestational age. When Dr. Amin Said is in the U.S. this summer, he will have an opportunity to observe Dubowitz measurements. The physicians will also assist in the pregnancy forms (Attachment III C,D and E)

V. Summary of Accomplishments

1. Protocols and training procedures were discussed with Egyptian scientists for the implementation of the next pilot study of 50 households. This study is scheduled to be completed in late April and the findings summarized for use in finalizing the design for Nutrition CRSP in mid-May at Berkeley.
2. Protocols were refined and the procedures were field-tested, in part, for Reproduction/Lactation. Six forms were developed for use in Reproduction/Lactation and were discussed and revised in accordance with the suggestions of Dr. Hussein Khalil, Statistician and Data Manager in Egypt.

3. Protocols and procedures were developed with Egyptian scientists for biological fluid measurements. Also, plans were discussed for laboratory quality control procedures and for inter-country standardization.
4. Plans were finalized for the supplies, equipment, space and staff needed for implementation of protocols for Reproduction/Lactation and for Biological Fluids.

Professional Contacts made in Egypt

Contacts were made with several individuals who are involved with Nutrition CRSP activities in Egypt. These individuals include:

Dr. Amin Abdou, Agricultural Economist, National Research Council

Dr. Hekmat El-Sayed Aly, Retired Director of Nutrition Institute and Member of Executive Committee for Nutrition CRSP

Dr. Zeinab Bishry, Professor Child Psychiatry, Department of Psychiatry, Ein-Shams University

Dr. Ahmad Dakroury, Head Department of Nutritional Biochemistry and Metabolism, Nutrition Institute

Dr. Nefisaa Hassan El-Banna, Foods and Nutrition Department, College of Home Economics, Helwan University, Cairo

Dr. A. M. El Naggar, Work Physiologist, Helwan University, Cairo

Dr. Osman Galal, Director, Nutrition Institute and PI Egypt Nutrition CRSP

Dr. Mohammed Hussein Khalil, Chairman, Department of Statistics, High Institute of Public Health, Alexandria, Egypt

Dr. Moustafa Mansour, Head, Biochemistry Department, U.S. Navy Medical Research Unit

Dr. Wafaa Moussa, Head, Department of Surveys, Surveillance and Programs, Nutrition Institute

Ms. Stephannie Sagabiel, Science Office, Embassy of the United States of America

Dr. Amin Said, Head, Department Clinical Nutrition, Nutrition Institute

Dr. Farouk Shaheen, Dept. of Surveys, Surveillance and Programs, Nutrition Institute

Dr. Zeinab Shaheen, National Center for Social and Criminological Research

Dr. June Wolgemuth, Field Coordinator, Nutrition Institute

Dr. Feisal A. Yunis, Department Psychology, Faculty of Arts, Cairo University

Attachment I

Itinerary

March 4-5	Travel from West Lafayette to Cairo
March 6 Sunday	Nutrition Institute
March 7 Monday	Nutrition Institute
March 8 Tuesday	Nutrition Institute
March 9 Wednesday	Nutrition Institute
March 10 Thursday	Village of Kalama
March 12 Saturday	Nutrition Institute
March 13 Sunday	Nutrition Institute, USAID
March 14 Monday	Nutrition Institute
March 15 Tuesday	Nutrition Institute, American Embassy
March 16 Wednesday	Nutrition Institute
March 17 Thursday	Village of Kalama
March 19 Saturday	University of Alexandria, Alexandria
March 20 Sunday	Nutrition Institute
March 21 Monday	Nutrition Institute
March 22 Tuesday	Nutrition Institute
March 23 Wednesday	Nutrition Institute, Catholic Relief Service
March 26 Saturday	Nutrition Institute
March 27 Sunday	Travel from Cairo to West Lafayette

Attachment II

Comparison of volume of milk intake of formula-fed Egyptian infants estimated by difference in bottle weight (before and after a feeding) to test weighing (WIO) and to 1-, 2- and 4-hour weights of infants.

Infant	Infant		Observation Period			Bottle Weight (Δ g)	Test Weighing WIO Procedure	Infant Weight 1-hr Interval	Comparison of Procedures		
	Age	Weight							WIO/Bottle	1-hr wt/Bottle	1-hr wt/WIO
	Mo	kg	Time	hrs	g milk intake	%	%	%			
0	7	8.90	11 am	1	3	132	125	142	95	108	114
1	9	7.90	11	3	4	302	273	300	90	99	110
*2	8	6.05	11	3	4	376	370	373	98	99	102
3	8	7.58	11	3	4	380	372	375	98	99	101
*6	8	6.05	12	2	2	338	330	312	98	92	95
7	5	5.10	9	3	6	402	374	388	93	97	104
8	3	4.80	10	3	5	312	304	279	97	89	92
9	3	4.70	10	2	4	316	309	291	98	92	94
**A	9		8	8	12	954	955	1051	100	91	91
Mean									96	96	100
								2-hr Interval		2-hr wt/Bottle	2-hr wt/WIO
1					2	94	80	75	85	80	94
					2	208	193	155	95	75	80
2					2	236	230	200	97	85	87
					2	140	140	107	100	76	76
3					2	250	247	200	99	80	81
					2	130	125	75	96	58	60
6					2	338	330	312	98	92	95
8					2	130	125	103	96	79	82
					2	90	89	59	99	66	66
9					2	216	211	194	102	90	92
					2	100	98	74	98	74	76
Mean									97	78	81
								4-hr Interval		4-hr wt/Bottle	4-hr wt/WIO
1					4	302	273	230	90	76	84
3					4	380	372	275	98	72	73
6					4	376	370	307	98	82	83
9					4	316	309	268	98	85	85
8					4	220	214	162	97	74	76
Mean									96	78	80

*Same infant

**Observation of infant in Lafayette, IN

REPRODUCTION HISTORY FORM I (FIRST VISIT)

Block No. H. H. No. Date Day Month Year
 Name of L. F. _____ Age Years
 Interviewer _____

Marital and Reproductive History

Duration of marriage Years
 Age of first marriage Years
 Age when first pregnant Years
 Number of marriages
 Number of living children
 Number of dead children
 Number of pregnancies
 Number of live births Males Females
 Number of abortions and miscarriages (<28 weeks)
 Number of stillbirths (>28 weeks)
 Number of normal deliveries
 Number of difficult deliveries Forceps Caesarean
 Present birth control measures Pill IUD
 Indigenous Local Not used

Menstrual History

Age at menarche Years
 Duration of intermenstrual period Days
 Duration of menstrual period Days
 Regularity of menses Regular Irregular
 Date of last menses Day Month Year
 Are you pregnant now? Yes No Not sure
 If yes, use Pregnancy Form III.
 Are you lactating? Yes No
 If yes, use Lactation/Infant Feeding Form V.

Lactation/Infant Feeding Practices History

Did you breast feed your children? Yes No Sometimes
If yes, when do you usually start breast feeding? Days after birth

For how long do you breast feed on the average? Months

At what age do you usually start supplementary feeding in addition to breast milk or formula? Months

What foods do you usually give as supplement?

What foods do you consider beneficial as supplements?

What foods do you consider undesirable or harmful as supplements?

Laboratory

Finger-prick blood withdrawn? Yes No

Venous blood withdrawn? Yes No

Hb . g/dl

Hct %

Ferritin . ng/ml

PREGNANCY MONTHLY VISITS (Form III)

Block No.

H. H. No.

Name of L. F. _____ Examiner _____

Date of last menses D M Y

Month	1	2	3	4	5	6	7	8	9	10
Date of Visit	<input type="text"/> <input type="text"/> D									
	<input type="text"/> <input type="text"/> M									
Information*										
Have you felt morning sickness? **										
Have you felt craving? **										
Have you felt heaviness in breasts? **										
Have you felt quickening? **										
Nipple enlarged? ***										
Colored areola? ***										
Lower limb edema? ***										

*If answer is yes, put 1, if no, put 2.

**If yes, when (in weeks)?

***By examination.

Morning Sickness Craving Breasts Quickenings

When pregnancy ends move to Form IV.

Attachment IIIC (Continued)

PREGNANCY MONTHLY VISITS (Form III) Cont.

Block No.

H. H. No.

Name of L. F. _____ Examiner _____

	1	2	3	4	5	6	7	8	9	10
Date of Visit	<input type="text"/> <input type="text"/> D									
	<input type="text"/> <input type="text"/> M									
Information										
Body weight (kg)										
Lt. mid-arm circumference, cm										
Lt. triceps skinfold thickness, mm										
Lt. biceps skinfold thickness, mm										
Blood pressure: S										
D										
Blood Hemoglobin (g/dl)	X	X		X	X		X	X		X
Hematocrit (%)	X	X		X	X		X	X		X
Ferritin (ng/ml)	X	X		X	X		X	X		X
Urine Albumin*										
Sugar*										
Ketones*										

* 0 = negative
 1 = +
 2 = ++
 3 = +++

2/2

PREGNANCY OUTCOME (Form IV)

Block No.

H. H. No.

Date D

M

Y

Date of Pregnancy Outcome D

M

Y

Name of L. F. _____ Examiner _____

Pregnancy outcome Abortion or miscarriage (<28 weeks)

Stillbirth (>28 weeks)

Live birth

If live born

Normal delivery

Complicated Hemorrhage

Forceps

Caesarean

Pleurality

Single Twins Triplets

Attended by

Self/Family "Daya"

Paramedical Physician/Hospital

Newborn

Birth weight . kg at age hours

Length . cm at age hours

H. C.

C. C.

A. C.

SFT

Gestational age

weeks by menstrual history

weeks by Dubowitz score at age hours

weeks by Dubowitz score at age days

Illness history and morbidity for L.F. and L.M. to be pulled out from morbidity forms concerning: Diabetes, Hypertension, T.B., Bilharzia, Pre-eclampsia and Eclampsia

LACTATION/INFANT FEEDING (Form V)

Block No.

H. H. No.

Name of L. F. _____ Examiner _____

Name of infant _____ Sex: Male Female Birth Date D M Y

Postpartum Period	8D	1	2	3	4	5	6	7	8	9	10	11	12	M
Information Date of Visit (Put 1 if answer is Yes; 2 if No.)														
Is baby breast fed?														
Is baby formula ¹ fed?														
Is baby fed mixed breast and formula?														
If breast fed: is he fed on demand?														
is he given both breasts?														
If yes, do you alternate the side to start with?														
Is your breast milk adequate for baby?														
Did you receive advice about feeding the baby?														
If formula fed: is formula diluted?														
is water boiled?														
Have supplements ² been introduced?														
If yes, is it adequate?														
Are there any side-effects from supplement?														
Breast milk samples taken from mother														
blood samples from mother														

¹A formula is a breast milk substitute.

²A supplement is to complement breast milk or formula. A formula may be given as a supplement to breast milk.

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LACTATION/INFANT FEEDING (Form VI)

Block No.

H. H. No.

Examiner _____

Name of L. F. _____

Name of infant _____

Sex M F

If baby is breast fed:

When did you first put baby on breast? days after birth

How many times do you breast feed? during day

during night sleep

How long do you allow baby to feed? minutes

How long for each breast? minutes

If baby is formula fed:

What type of milk formula is used?

Cows milk Buffalo milk Goats milk Donkey milk

Powdered dry milk Others-Specify:

How many times do you formula feed? during day

during night

Do you dilute formula? Yes No

If yes, ratio of formula to water :

Is the water boiled? Yes No

If baby is given supplements

Why did you start supplementation? _____

Attachment IV

Comparison of fat content in milk from right and left breast and in fore and hind milk obtained from Egyptian women.

Subject	Breast	Total Fat Content ¹
		g/dl
1	Lt	5.8
	Rt	6.4
2	Lt	7.8
	Rt	5.7
3	Lt	---
	Rt	3.9
4	Lt	5.6
	Rt	7.3
5	Lt	1.7
6	Rt	3.8
7	Lt	1.0
	Rt	2.3
8	Lt-fore	---
	Lt-hind	7.8
	Rt-fore	5.8
9	Lt-fore	4.6
	Lt-hind	6.8
	Rt-fore	6.1
	Rt-hind	11.2

¹Lucas, A. et al. Creamatocrit: Simple clinical technique for estimating fat concentration and energy value of human milk. Bri. Med. J. 1:1018-1020, 1978.

2/0



Attachment VA
DEPARTMENT OF THE NAVY
U. S. NAVAL MEDICAL RESEARCH UNIT NO. 3
FLEET POST OFFICE
NEW YORK 09527

IN REPLY REFER TO:

NAMRU-3:AO:HVP:db

23 March 1983

TO WHOM IT MAY CONCERN:

This is to certify that the bearer, Dr. Avanelle Kirksey, U.S. Citizen, [REDACTED], is carrying with her twelve (12) samples of human milk, packed in dry ice, from clinically healthy individuals. These samples are non infectious and are to be used primarily for scientific experimental purposes, under the guidelines of a grant entitled "Nutrition CRSP" funded and sponsored by U.S.A.I.D., State Department, Washington, D.C., and Purdue University, Lafayette, Indiana.

A handwritten signature in cursive script, reading "H.V. Petersen", is written over a horizontal line.

H.V. PETERSEN
Director of Administrative Services

4/1



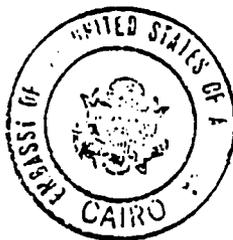
Attachment VB
EMBASSY OF THE
UNITED STATES OF AMERICA

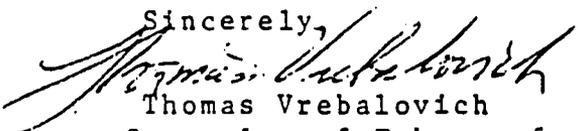
Cairo, Egypt
March 22, 1983

TO WHOM IT MAY CONCERN:

This is to certify that this package contains vials of human milk samples obtained from women participating in a Nutrition Survey in the village of Kalama, Egypt. These samples are non-pathogenic, and are being returned for vitamin analysis at Purdue University, a participating institution in the Nutrition Project in Egypt. Dr. Avanelle Kirksey, a senior scientist with the project, will transport the samples to Purdue University.

Thank you for your assistance in this matter.



Sincerely,

Thomas Vrebalovich
Counselor of Embassy for
Science and Technology

TRIP REPORT
March 4, 1983 to March 27, 1983

Marlene W. Borschel, R.D., Ph.D.
Department of Foods and Nutrition
Purdue University
West Lafayette, IN 47907

Purpose

The primary purpose of my visit to Egypt was to assist in the development of the test weighing procedure to be used in the field site (Kalama), testing alternative methods of assessing milk volume intakes of infants and establishing protocol for milk sample collection and nutrient analysis. In addition, I assisted in the development of questionnaires to be used in collection of data.

Evaluation of Test-Weighing (Conventional)

Percent recovery of a known quantity of milk volume consumed by formula-fed (FF) infants was +95% when the K-Tron electronic balance was used (Table 1). Test-weighing was conducted at the Nutrition Institute and at the village site (Kalama). After visitation to the field site, it was confirmed that conventional test-weighing, at least during the daytime hours, can be accomplished since the mothers in Kalama do not carry the infants with them during the day. It had originally been stated that in all CRSP communities infants were carried about by the mother (1). Although the mothers nurse the infant more frequently in Kalama compared to in the US, the daytime nursing episodes are clearly defined. After questioning, village women repeatedly expressed awareness of the experience of milk "let-down". It is my opinion that conventional test-weighing is the method of choice for daytime milk volume assessment. The possibility exists that a factor can be established for the percent of milk volume consumed at night thus enabling estimation of total milk volume intakes. If improvements can be made in existing facilities at the village site and some incentives offered, the feeling is that some women may be willing to spend the night at the facility so that test-weighings can be performed.

Evaluation of Test-Weighing Alternatives (Hourly)

The modified test-weighing procedure proposed by the University of Arizona (1) was tested at the Nutrition Institute over approximately 4 hour intervals in FF infants. A slight modification in the calculation of milk volume was used. The differences in hourly weights were summed regardless of sign and then the weight of waste was subtracted (only if the diaper had been changed during the test period). This calculation accounts for insensible water loss which could vary greatly between infants and in the same infant on different days.

Milk volume intakes determined by this method were 89-108% of the volume lost from the bottle during the same period. The mean percent difference (Hourly/Bottle) was 97% (Table 1). When milk volume intakes were estimated using weight differences at 2 or 4 hour intervals, percent differences (Hourly/Bottle) were 78%, ranging from 58-92% (Table 1). Thus, it seems that if the modified test-weighing procedure is used, weighings must be performed hourly with strict attention paid to clothing changes, intake of additional foods, etc. It may be noted that this method would not be accurate when solids are introduced to infants. This seems to occur in the majority of Egyptian infants by 5-6 months of age, but may occur earlier.

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Table 1. Comparison of conventional test weighing and a modified infant-weighing method at 1,2 and 4 hour interval to assess milk intake of formula-fed Egyptian infants.

Infant	Age	Weight	Observation		Test weighing			WHO/ Bottle	Percentage	
					WHO	Bottle	Hourly		Hourly/ Bottle	Hourly/ WHO
	Mo	kg	Time	hrs	g milk intake			%		
Test Weighing-One Hour Interval										
0	7	8.90	11-1	3	125	132	142	95	108	114
1	9	7.90	11-3	4	273	302	300	90	99	110
*2	8	6.05	11-3	4	370	376	373	98	99	102
3	8	7.58	11-3	4	372	380	375	98	99	101
*6	8	6.05	12-2	2	330	338	312	98	92	95
7	5	5.10	9-3	6	374	402	388	93	97	104
8	3	4.80	10-3	5	304	312	279	97	89	92
9	3	4.70	10-2	4	309	316	291	98	92	94
**A	9		8-8	12	955	954	1051	<u>100</u> 96	<u>91</u> 96	<u>91</u> 100
Test Weighing-Two Hour Interval										
1				2	80	94	75	85	80	94
				2	193	208	155	95	75	80
2				2	230	236	200	97	85	87
				2	140	140	107	100	76	76
3				2	247	250	200	99	80	81
				2	125	130	75	96	58	60
6				2	330	338	312	98	92	95
8				2	125	130	103	96	79	82
				2	89	90	59	99	66	66
9				2	211	216	194	102	90	92
				2	98	100	74	<u>98</u> 97	<u>74</u> 78	<u>76</u> 81
Test Weighing-Four Hour Interval										
1				4	273	302	230	90	76	84
3				4	372	380	275	98	72	73
6				4	370	376	307	98	82	83
9				4	309	316	268	98	85	85
8				4	214	220	162	<u>97</u> 96	<u>74</u> 78	<u>76</u> 80

*Same infant

**Infant studied in Lafayette, IN (Detecto Scale)

Analysis of Human Milk for Selected Nutrients

Human milk samples were collected in Kalama and transported to the United States for analysis of selected nutrients. Samples were collected under subdued light into amber vials and kept cool during transport between Kalama and the Nutrition Institute. Samples were frozen at the Nutrition Institute and kept frozen during transport to the United States. Samples were expressed from the right (Rt) and left (Lt) breasts of four women and from one breast of two women on March 17, 1983. In addition, two separate samples of pooled milk obtained from storage at the Nutrition Institute were divided so analysis of specific nutrients could be performed in Egypt and in our laboratory for comparison.

Total Fat Analysis

Fat content (g/l) was determined by personnel at the Nutrition Institute using the Creamatocrit method (2). Data from 6 women and 3 additional women (collected in Kalama by us on March 10, 1983) is presented in Table 2. Total fat content ranged from 9.7-112.4 g/l. The average fat content of mature human milk has been reported to be 34, 38, 45 and 48 g/l (3,4,5). Mean fore milk fat content has been reported to be 22.6 ± 15.3 g/l (range 1.6-66.8 g/l) whereas mean hind fat content was 39.4 ± 18.0 g/l (range 5.3-91.1 g/l) (4).

Vitamin Analysis

Milk samples were analyzed for vitamin C, vitamin B-6 and folacin (total and free). Levels of all vitamins, presented on Table 3, were representative of samples previously analyzed in our laboratory. In regards to vitamin C, it may be noted that residents of Kalama seemed to have ample supplies of citrus fruits, especially oranges. The vitamin B-6 content of human milk has been demonstrated to be a sensitive indicator of maternal status of the vitamin. Levels of vitamin B-6 in these samples were similar or higher than those analyzed in this laboratory for unsupplemented women. The differences in free folacin and vitamin B-6 levels in Lt and Rt breasts of some women (#2, #3, #4) may warrant further investigation.

We plan to analyze the milk samples for selected minerals, such as zinc, and for protein.

References

1. Harrison, G.G., Ritenbaugh, C. and Mohs, M. A preliminary pilot study of a modified infant-weighing method to estimate breast milk intake, University of Arizona, January 14, 1983.
2. Lucas, A., Gibbs, J.A.H., Lyster, R.L.J. and Baum, J.D. Creamatocrit: simple clinical technique for estimating fat concentration and energy value of human milk. Br. Med. J. 1:1018-1020, 1978.
3. Belavady, B. Quantity and composition of breast milk in malnourished mothers. XIV Symp. Swed. Nutr. Found., pp. 62-68, 1977.
4. Dorea, J.G., Horner, M.R., Bezerra, V.L. Correlation between changeable human milk intake in breast-fed babies. J. Pediatr. 101:80-83, 1982.
5. Jensen, R.G., Hagerty, M.M. and McMahon, K.E. Lipids of human milk and infant formulas: a review. Am. J. Clin. Nutr. 31:990-1016, 1978.

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Table 2. Fat content of human milk of Egyptian women determined by the Creamatocrit method.

Mother	Breast Side	Total Fat
1	Lt	57.6
	Rt	64.5
2	Lt	78.2
	Rt	56.7
3	Lt	104.7
	Rt	38.8
4	Lt	55.9
	Rt	73.0
5	Lt	16.5
6	Rt	37.9
7	Lt	9.7
	Rt	23.4
8	Lt-fore	—
	Lt-hind	78.2
	Rt-fore	57.6
9	Lt-fore	45.6
	Lt-hind	67.9
	Rt-fore	61.0
	Rt-hind	112.4

Table 3. Vitamin C, vitamin B-6 and folacin content of human milk of Egyptian women.

Mother	Breast Side	Vitamin C mg/l	Folacin		Vitamin B-6 µg/l
			Total µg/l	Free	
1	Lt	78.4	55.3	46.2	351
	Rt	----	57.3	47.9	283
2	Lt	----	64.6	47.4	335
	Rt	----	54.0	44.1	215
3	Lt	----	74.6	72.8	113
	Rt	----	66.2	30.1	374
4	Lt	76.5	57.3	42.4	101
	Rt	----	----	----	226
5	Lt	78.4	40.6	36.0	151
6	Rt	116.4	72.8	60.9	234
Pooled #1	,	4.3	15.4	12.1	145
Pooled #2		10.9	67.8	44.1	134

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MEXICO PROJECT: Seventh Quarterly Report

May, 1983

Activities in Mexico

The emphasis on refinements and pretesting of research instruments and strategies, census activities and training continued through this quarter. Drs. L. Allen and G. Pelto were in residence in Connecticut during this period. However, Dr. Allen spent a period of approximately 3 weeks and Dr. Bert Pelto approximately 2 weeks in Solis and Mexico City in March. Peter Guarnaccia (UConn field liason and researcher) and Todd Walker (research assistant in cognitive studies) were in residence in the field throughout this quarter.

Noteworthy events in Solis and Mexico City during this quarter included:

1. Further census activities in the 4 preliminary study communities were undertaken. Updated demographic data was collected by the quarter's end. Houses were numbered and maps of the communities were revised to include household numbers.
2. A food intake pilot, including comparison of 24 hour recall vs. twice daily recall methods and validation of recall with weighing and measuring methods, was completed.
3. A short form of the SES questionnaire was developed and pretested.
4. A questionnaire for measuring household productivity was developed and pretested.
5. An examiner (new INN staff member) was trained (by Todd Walker) in administration of the Brazelton examination. Approximately 50 infants were examined.
6. Observation of behavior of school children was begun. (Todd Walker, 2-3 days/week)

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7. Three new INN staff were trained for work in the morbidity study. As of this report, they are being trained in aspects of primary health care.
8. Software for data entry in the field was developed.

Activities in Storrs (also Berkeley)

In Storrs the essential character of activities during this quarter, in addition to general bureaucratic maintenance of the project, was preparation for the May planning meetings in Berkeley, the upcoming summer field residence of project PI's, Co-P.I. and subcontractors, and setting up for a summer of pretesting and finalization of research protocols. This included acquisition of equipment to be transferred to INN and further refinements of research questionnaires. All this was directed toward finalization of research methodology for the main data collection phase of the project, currently hypothesized to commence next fall (1983).

Major activities and events included the following:

1. An 18 month budget was prepared (mailed April 5) for the next budget period, to begin 4/1/83. This budget was subdivided into a 6 month section (4/1 - 9/30/83) and a 12 month section (10/1/83 - 9/30/84), to adjust to coincide with the A.I.D. fiscal year. An old allocation period ended 3/31/83 (Year II) and a new one began 4/1/83 (Year III?). Received word from Dr. Balderston that the new allocation from A.I.D. had been approved. A contract amendment containing the amounts of the next allocation was sent to UConn from Berkeley, reviewed, signed and returned (by May). The current allocation period ends 9/30/83, probably timed to provide for adjustment of cost share projections (see problem section below).

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An advance from Berkeley to UConn was due to arrive any day as the quarter came to a close.

2. UConn process for ordering computer equipment for Storrs was initiated first week in April. Purchase requests emanated from the University in mid-May. Terminals, controllers, printer, etc. are expected to arrive in June.
3. Some equipment for INN (pieces "unfrozen" by M.E. or not subject to authorization) was ordered in first week of April. A trickle of equipment began arriving at Storrs by the latter part of the month. By the end of May a significant amount (balance, bacteria colony counter, oven, incubator, scales, calipers, liquid nitrogen unit, lab equipment) had arrived. This equipment passes through Storrs since it is being purchased by UConn and donated to INN. It currently is being temporarily stored in Storrs, pending arrangements between INN and Mexican customs.
4. The UConn Human Use Committee informed us of the renewed approval of the project (May).
5. A more extensive analysis of pilot study data, including more specific demographic description and correlations between anthropometric, calorie intake, S.E.S., and cognitive data, was completed for the Berkeley planning meetings.
6. Drs. Allen and Pelto joined M.E. and other P.I.'s for planning meetings in Berkeley (May 17 - 24).

Problems:

1. M.E. expressed concern that UConn projected cost share would apparently fall below 25% by 9/84. M.E. decided to allocate the full UConn request from A.I.D. until 9/30/83 and requested additional cost share

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projection for the next 12 month period. Most of the problem was alleviated when A.I.D. finally officially deleted equipment to be donated to INN from the total requiring cost share. Arrangements are being made at UConn to provide the small additional amount (approximately 6900) necessary to bring the match to 25% by 9/84.

2. The spring equipment thaw is not totally complete. The major concern regarding equipment affected is equipment necessary for energy expenditure (activity, RMR). Given the objective of pretesting and standardizing methodology before the fall, a rapid decision is necessary on what equipment will be used so that equipment can be purchased and shipped to Mexico during the summer. If the equipment to be purchased has not previously been requested by UConn and authorized by Berkeley, an effort should be made to expedite the request/authorization process. Unfortunately, it is unlikely, that this equipment will be available for use in Mexico during this summer.

Objectives for Upcoming Quarter

Activities Projected for Mexico:

1. Develop schedules/priorities for summer project operations.
2. Continue to refine, pretest and analyze research instruments and methodologies. Test and standardize equipment necessary for data collection in the main phase.
3. Continue to build capacity for data entry in the field.

L. Allen, G. & P. Pelto, P. Guarnaccia and T. Walker will be in residence in Mexico. G. Finley and T. Field will make site visits.

Activities Projected for Storrs:

1. Install computer equipment at Storrs.
2. Ship major portion of equipment to be donated to INN.
3. Order all equipment to be donated to INN.
4. Refine data interaction systems INN to UConn, UConn to Berkeley.

Refine data management system in Storrs in preparation for upcoming massive data collection in main phase (e.g. develop coding protocols for final questionnaire as they are available.)

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Nutrition CRSP Kenya ProjectQuarterly Progress ReportMarch 1, 1983 - May 31, 1983

The major activities of the Nutrition CRSP Kenya Project were as follows:

Kenya

- (1) The entire senior project personnel had a retreat at the Green Hills Hotel, Nyeri. Present were Professors Kagia, Bwibo, Thairu, Neumann, and Drs. Meme, Kinote, Jansen, Cattle, Carter. The purposes were to look at the CRSP in its entirety, to have a common understanding of other disciplines' CRSP procedures, and to share non-field insights among colleagues. The contents, introduction, and definition of core studies is attached. The entire minutes are available upon request.
- (2) The preliminary survey was completed on over 800 households. Data from the first 500 households are at UCLA being analyzed; the remainder is on the way.
- (3) The subcontract with the University of Nairobi was signed with an official letter from the U. of Nairobi Registrar. The procedures for orderly money flow are being worked out. The first quarterly payment directly through the University of Nairobi is on the way.
- (4) The pilot study methodologies/protocols are being prepared. Some testing of these pilots was completed along with training of new enumerators.
- (5) New staff arrivals: Susan Weinberg, nutritionist, to develop the food intake methodology; Susan Roberts, nutritionist, to assist in the food intake methodology as an expert consultant. Susan Weinberg is a long-term employee of the project; Susan Roberts has a 3-month commitment. Both are currently settled in Embu.
- (6) A laboratory/dormitory/office building was built in Embu to provide work

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subsequent to the PIs' decisions during the meeting.

(2) We are actively recruiting for a full-time physician for both the short-term (3-month start-up period) and the long-term (duration of the definitive study).

DRAFTNot For Quotation
Or Publication

Received 6/10/82

Submitted by the Reproduction IAG:
 Lindsay Allen
 Nancy Butte
 Avanelle Kirksey
 Janet C. King
 Cheryl Ritenbaugh
 Steve Read

Reproductive Function
 (Additional information to follow after
 decisions are made on the primary measurements)

I. Fertility Assessment

Research Question One: Does variation in food intake alter the
 length of postpartum amenorrhea in lactating women?

Independent Variable

- a. Food Intake

Dependent Variables

- a. Onset of menses
 b. Fall in urinary
 estriol
 c. Birth interval

Confounding Variables

- a. Maternal nutritional status at conception, at deliv-
 ery, and during lactation.
 height, weight, skinfolds, body circumferences
- b. Infant feeding pattern.
 frequency, length of feeding
- c. Milk Volume Output.
- d. Infant supplemental foods.
- e. Environmental conditions: maternal illness,
 infant illness, climate, agricultural work.

Data NeededWhen CollectedResources Needed

<u>Data Needed</u>	<u>When Collected</u>	<u>Resources Needed</u>
1. Food Intake	Biweekly till end of lactation/end of study	Standardized Food Intake Pro- cedure; see Food Intake TAG.
2. Onset of menses	Biweekly questionnaire	Culturally appropriate questions.

Data Needed	When Collected	Resources Needed
<p>3. Urinary estriol levels.</p>	<p>Every 3 months</p> <p>24 hour collection from the mother during the test-weighting day.</p>	<p>Laboratory to perform urinary estriol assays.</p> <p>Urine jugs</p> <p>Ice chest</p> <p>Freezer for storage</p> <p>Dry Ice for shipping</p>
<p>4. Birth Interval All women 18-45 years. Ages of all live-born children.</p>	<p>Initial Interview</p>	<p>Questionnaire with culturally appropriate questions.</p> <p>Well-trained, local interviewer.</p>
<p>5. Maternal Nutritional Status</p> <p>All women 18-45 years Weight, height, skin-folds and circumferences.</p>	<p>Every 3 months till pregnant, then monthly throughout pregnancy and lactation.</p>	<p>See Nutritional Status TAG Report</p> <p>Equipment:</p> <p>Balance</p> <p>Adult height board</p> <p>Skinfold calipers</p> <p>Plastic flexible tapes</p>
<p>6. Infant Feeding Pattern All infants breast-fed fully or partially</p> <p>a. Number of feedings daily</p> <p>b. Length (minutes) of each feeding.</p>	<p>One day biweekly when test weighing done.</p>	<p>Forms for recording data</p> <p>Well-trained home observers</p> <p>Stop-watches</p>
<p>7. Milk Volume Output All lactating women. Weight of infants before and after each feeding</p>	<p>Every 3 months</p>	<p>Infant balance</p> <p>Well-trained home aid</p>

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Data Needed	When Collected	Resources Needed
<p>8. Infant intake of supplemental foods. All infants breast-fed fully or partially</p> <p>a. What eaten b. How much c. When</p>	<p>One day biweekly when test weighing done.</p>	<p>Forms for recording data Well-trained home observers</p>
<p>9. Environmental Conditions</p> <p>a. Maternal Illness b. Infant Illness c. Climate: Rainy/Dry season d. Agricultural work</p> <p>Mother: Hours worked in fields. Mother: Number of minutes in heavy activity, i.e. on feet and lifting, scooping, digging, carrying, etc.</p>	<p>Record biweekly when assessing food intake.</p>	<p>Forms with culturally appropriate questions and for tallying heavy activity. Well-trained home interviewer/observer. Watches See Morbidity and Social Performance TAG's.</p>

Research Question Two: Do chronic differences in food intake alter the age of menarche?

Independent Variable

- a. Food Intake

Dependent Variables

- a. Age of first menstrual period
- b. Peak height and weight velocity

Confounding Variables

- a. Early Nutrition History: Malnutrition leading to growth retardation early in life; menarche delayed until a critical size achieved; thus age of menarche may be unrelated to current nutritional state.
- b. Activity patterns.
- c. Body composition
Body fat

Data Needed

When Collected

Resources Needed

Data Needed	When Collected	Resources Needed
<p>1. Food Intake</p> <p>a. All pre-pubertal and pubertal girls years of age.</p> <p>b. All women between 18 and 45 years.</p>	<p>Biweekly</p>	<p>Standardized procedure for weighed/measured intakes or for 24 hour recalls. See Food Intake TAG.</p>
<p>2. Age of first menstrual period.</p> <p>All women between 10 and 45 years.</p>	<p>Initial Interview</p>	<p>Culturally appropriate questions.</p>
<p>3. Related issues</p> <p>a. Age when first married.</p> <p>b. Age when first pregnant.</p>	<p>Initial Interview</p>	<p>Culturally appropriate questions.</p>
<p>4. Peak Height and weight velocity</p> <p>All pre-pubertal and pubertal girls</p> <p>Weight, Height Arm Circumference Skinfolds</p>	<p>Every 3 months.</p>	<p>See Nutritional Assessment TAG. Balance Adult height board Skinfold calipers Plastic, flexible tape.</p>
<p>5. Body Fat</p> <p>Skinfolds, weight</p>	<p>Every 3 months.</p>	<p>Same as above.</p>
<p>6. Early Nutrition History</p> <p>All girls 9-18 years</p> <p>a. Hospitalized before 5 years of age?</p> <p>b. If so, why?</p> <p>c. If hospital records are available, obtain heights and weights at that time.</p>	<p>Initial Interview</p>	<p>Culturally appropriate questions.</p>
<p>7. Activity Pattern or Energy Expenditure</p>	<p>Every 3 months.</p>	<p>See Activity TAG.</p>

II. Pregnancy Assessment

Research Question One: What are the effects on the malnourished woman of the additional nutritional stresses imposed by pregnancy?

Independent Variables

- a. Food Intake
- b. Stage of pregnancy

Dependent Variables

- a. body composition (fat, LBM)
- b. weight gain
- c. growth (in growing women)
- d. activity patterns, energy expenditure
- e. RQ, BMR
- f. post-prandial thermic effect
- g. protein turnover
- h. urinary ketones
- i. postpartum weight

Confounding Variables

- Parity
- Age
- Length of lactation
- Illness, disease (Nausea), vomiting

Optional Dependent Variables

- a. urinary estriol
- b. plasma prolactin, HPL, growth hormone, progesterone

Data Needed	When Collected	Resources Needed
1. Food Intake (including preferences, avoidances, vomiting)	3rd/month	
2. Stage of Gestation Date of LMP Data of "quickenings"	Monthly questioning about occurrence of menses 16-24 weeks of gestation	Question Question

Data Needed	When Collected	Resources Needed
<p>3. Body Composition & Growth</p> <p>Weight Circumferences -calf } mid -thigh } -arm } Skinfolds -triceps -biceps -costal -suprailiac -subscapular Height Urinary nitrogen Urinary creatinine</p>	<p>monthly monthly monthly monthly At 3,6,9 months</p>	<p>Scales Tape measures Calipers Adult height board Kjeldahls ?</p>
<p>4. Activity/Energy Expend. Heart rate monitors on women not in activity study; not calibrated.</p>	<p>2-consecutive days/at 3,6,7,5,9 months</p>	<p>4 heart rate monitors 3 technicians</p>
<p>5. RQ, BMR O_2 CO_2 consumption at rest</p>	<p>6, 9 months gestation fasting, after resting 30'</p>	<p>respirometer O_2/CO_2 analyzers (work capacity/equipment)</p>
<p>6. Postprandial thermic effect postprandial O_2/CO_2 consumption</p>	<p>substudy only 3, 9 months gestation</p>	<p>work capacity equipment standard meal</p>
<p>7. Protein Turnover -Urinary 3 ME' histidine</p>	<p>6 and 9 months gestation</p>	<p>no meat 3 d. prior 24 hr. urine sample</p>
<p>8. Muscle Mass - Urinary creatinine</p>	<p>3,6 and 9 months gestation</p>	<p>24-hour urine sample</p>

Data Needed	When Collected	Resources Needed
<p>9. Use of Fat Stores</p> <p>-Urinary ketones</p> <p>-Fasting respiratory ratios</p>	<p>3,6 and 9 month gestation</p> <p>6 and 9 month gestation</p>	<p>spot urine sample; fasting a.m.</p> <p>respirometer</p> <p>O₂ + CO₂ analyzers</p>
<p>10. Metabolic Changes</p> <p>Urinary estriol</p> <p>A possible substudy!</p> <p>Plasma prolactin</p> <p>Plasma HPL</p> <p>Plasma growth hormone (plasma proesterone)</p>	<p>3,6 and 9 month gestation</p>	<p>24-hour urine sample</p> <p>gamma counter</p> <p>gamma counter</p> <p>RIA</p>

Research Question Two: Are there adaptations to energy deficit in the pregnant woman?

Independent Variables

- a. Food intake
- b. Stage of pregnancy

Dependent Variables

- a. Body composition
- b. Activity, energy expenditure
- c. BMR/RQ
- d. Postprandial thermic effect

Data needed, when collected, resources needed as in question one.

Research Question Three: What are the effects of marginal malnutrition during pregnancy on pregnancy outcome?

Independent Variables

- a. Food intake
- b. Body composition
- c. Weight gain

Dependent Variables

- a. Weight of infant at 0-24 hr. and 3-5 d.
- b. Height at 1-5 d.
- c. Skinfolds; biceps, triceps, subscapular, mid-abdominal; 1-5 d.
- d. Head, mid-arm, chest circumference 1-5 d.
- e. Hemorrhage; abnormalities in labor and delivery

Resources as per question 1 except Infant scales, Infantometer

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Other research questions

Seasonal effects on the above dependent variables

Effect of repeated pregnancies

Effect of duration of lactation

III. Lactation Assessment

Research Question One: What is the effect of malnutrition on the quantity of milk produced?

Independent Variables

- a. Food Intake
- b. Body composition and anthropometry

Dependent Variables

- a. Milk volume produced

Confounding Variables

- Illness - mother and infant
- Infant size
- Agricultural work
- Maternal activity/work
- Stage of lactation
- Infant supplementary feeding
- Maternal age, parity, birth interval
- Contraceptive use

Data Needed	When Collected	Resources Needed
Milk volume	4 wks postpartum Every 3 months starting at 3 months postpartum	Test-weighing for a 24-hr period. Standardized electronic balance (K-Tron, Phoenix scale co., Glendale, AZ)

Research Question Two: What is the effect of malnutrition on the quality of milk produced?

Independent and confounding variables - as in question one.

Dependent variables: Total energy and total lipids

Data Needed	When Collected	Resources Needed
Milk sample	At mid-day (between 1000 and 1400 hours), 1 1/2 to 3 hours after previous feeding, all milk from the right breast will be expressed. Done at 4 wks. postpartum and every 3 months starting at 3 months.	Loyd-B-pump. Dry ice chest Amber plastic sample storage containers

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Data Needed	When Collected	Resources Needed
Total Energy Content		Carr Bomb calorimeter and by creatinocrit. (hemotocrit centrifuge and reader)
Total lipid content Modified Folch and creatinocrit methods		hematocrit centrifuge and reader; drying oven, exhaust hood, balance.

Research Question Three:

What is the effect of malnutrition on the infant feeding pattern?

See question one for independent and confounding variables.

Dependent variables: Length and frequency of infant feeding.

Data Needed	When Collected	Resources Needed
Infant feeding frequency and length of each feeding.	During test-weighing day.	Home observer Forms to record data.

Research Question Four: What are the effects of malnutrition on patterns of body composition changes in the lactating mother and the infant?

Data Needed	When Collected	Resources Needed
<u>Maternal:</u> height weight skinfolts -triceps -biceps -costal -suprailiac -subscapular Circumferences -calf -thigh } mid -arm }	Monthly	See Nutritional Assessment TAG.

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Data Needed	When Collected	Resources Needed
Infant: height weight skinfolts - same as maternal		
Circumferences: head chest -calf } -thigh } mid -arm }		

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Schedule of Reproductive Measures

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Measure	Pre-pregnancy conception								EFFICIENCY																	
	0	1	2	3	4	5	6	7	8	Lactation																
	months								9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
Food Intake:																										
Mother	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Infant																										
Test weighing										X	X					X				X			X			
Supplementary feed and beverage										X	X					X				X			X			
Milk composition										X	X					X				X			X			
Feeding pattern										X	X					X				X			X			
Anthropometry:																										
Mother	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Infant																										
Birth measures										X																
Monthly measures										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Biochemical:																										
Mother:																										
24 hour urine	X									X						X				X						
AM fasting urine (ketones)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plasma (substudy)																										
Hormones: HPL (B only) &H, Prolactin (lac only)										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Activity																										
Mother:																										
BMR, R.Q.						X				X						X				X						
Activity Pattern (HR Monitors)						X				X	X	X				X				X						
Ethnographic Information																										
Household Evaluation	X																									
Reproductive Indices																										
Menses Quickening			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Schedule of Measurements
during one of the months when
all measures will be made.

Week I: Food Assessment Week

DAYS	1	2	3	4	5	6	7
Mother's Food Intake Assess.	x		x		x		
Maternal Milk sampling		x					
AM Blood and urine sampling		x					
Test weighing					x		
Infant feeding pattern					x		
24-hour urine					x		

Week II: Energy Assessment Week

Heart rate		x	x				
BMR				x			
Anthropometry		x					
Postprandial thermic effect				x			

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