

There are five areas of study

1. Disease response
2. Reproductive competence
3. Work performance
4. Cognitive + sensory capacity
5. Social competence

Hold for BIFAD
Meeting

9311011/53

PO-1111 72/1
15N 30129

There will be a 3 day workshop on each of these areas.
(Between September + December)

15-16 people at each.
2 papers
- Biological
- Social

QUARTERLY REPORT #1: APRIL - JUNE 1978

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Project Number: 931-1011.14

FUNCTIONAL SIGNIFICANCE OF MARGINAL

NUTRIENT DEFICIENCIES: PROGRAM-PROJECT PLANNING

By

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Prepared For

United States Agency for International Development

and the Joint Research Committee

Board for International Food and Agricultural Development

Dr. Prothro wants
a copy. Have CB
send her one

FIRST QUARTERLY REPORT ON THE FUNCTIONAL SIGNIFICANCE
OF MARGINAL NUTRIENT DEFICIENCIES

The general plan for accomplishment of this project is to identify institutions individuals qualified ultimately to participate in the research program; to develop specific research projects and plans with the aid of experts qualified in each of the five sub-areas of study now envisioned; to obtain detailed project plans from potential investigators or consortia; to develop alternative research programs with different financial and time implications; and to suggest a strategy for administration of the research program.

Time Schedule

A time schedule for the year-long planning phase has been developed. A summary of this schedule is given in Table 1.

TABLE 1
 TIME SCHEDULE FOR PLANNING OF FUNCTIONAL SIGNIFICANCE
 OF MARGINAL NUTRIENT DEFICIENCIES PROJECT

- April 1978
- Grant activated.
 - Meeting between Dr. Calloway and Dr. Kahn to discuss announcement of research opportunity.
- May 1978
- Identification of major program areas (disease, reproduction, work productivity, cognitive and sensory capacity, and social competence).
 - Preparation and mailing of announcement.
 - Meeting between Dr. Calloway and representatives of BIFAD, JRC and USAID to discuss steering group and procedural detail.
 - Literature search to identify major investigators in each program area.
 - Selection of authors of principal background papers.
 - Formation of steering groups.
- June 1978
- Contact authors to request principal background papers.
 - Determination of dates for workshops.
 - Determination of criteria for selection of workshop participants.

*Monstein
 Foreman
 Parker
 Brown
 Rosdel*

- June 1978 (cont.)**
- Preparation of a description of subject matter and time schedule for each workshop to be sent to participants.
 - Preparation of criteria for choosing U.S. institutions to submit proposals.
- July 1978**
- Receipt of responses to announcement from U.S. institutions and rating of their eligibility.
 - Decide location and final dates for each workshop.
 - Collect references and background material to be available at workshops.
 - Secure travel arrangements of participants.
- August 1978**
- Final arrangements for workshops.
 - Steering group meeting to discuss U.S. institutions and site visits by steering group members.
- September, October
November 1978**
- Hold workshops on disease (Sept. 25-29); work productivity (October 30-November 3); reproductive competence; cognitive ability; and social competence.
- December 1978**
- Steering group meeting to develop information for potential project proposals and to evaluate how research

December 1978 (cont.)

designs fit BIFAD/JRC criteria for a Collaborative Research Support Program (CRSP).

- Compilation of final reports from each workshop.

January 1979

- Consultations with experts on aspects of design.

- Publish in Federal Register.

- Final selection and contact of institutions to prepare proposals.

January, February, March,
April 1979

- Site visits to U.S. and foreign institutions.

- Consultation with potential investigators.

- Development of criteria to evaluate proposals.

April 1979

- Receipt of proposals and evaluation.

May 1979

- Steering group meeting with probable research groups to decide institutional arrangement.

May, June 1979

- Complete arrangements.
- Finalize report.

Identification of Major Program Areas

The five program areas (disease response, reproductive competence, work productivity, cognitive and sensory ability, and social competence) were agreed upon at the workshop on Function Definition of Nutritional Status which was held July 18-21, 1977, by the National Research Council of the National Academy of Sciences. It was decided that workshops would be held focusing on each of the five areas.

Announcement

The following page contains the text of the Notice of Research Opportunity Under USAID, Title XII: Intake and Function. Table 2 lists the individuals and institutions that were sent this announcement in May 1978. This list comprises all BIFAD-eligible institutions (the 1862 Land Grant Universities and other Agricultural Institutions), participants at the Workshop on Functional Definition of Nutritional Status and some individuals in potentially interested departments in various institutions. We have received 40 responses to the Notice of Research Opportunity from these institutions. These are listed in Table 3. In order to ensure that all U.S. institutions with the capacity to undertake research in the program areas are contacted, an inventory is being prepared of non-BIFAD-eligible institutions with known human nutrition research competency and the announcement will be sent to them. It should be possible for BIFAD-eligible and noneligible institutions to collaborate on the CRSP.

A scoring system is presently being developed for evaluation of the responses. The final version of this system will be presented and described in the next quarterly report.



COLLEGE OF NATURAL RESOURCES
 AGRICULTURAL EXPERIMENT STATION
 DEPARTMENT OF NUTRITIONAL SCIENCES

BERKELEY, CALIFORNIA 94720

NOTICE OF RESEARCH OPPORTUNITY UNDER USAID, TITLE XII: INTAKE AND FUNCTION

The University of California at Berkeley is assisting USAID to plan a program of collaborative research on the relationship of nutritional intake to the maintenance of functional competency. This research topic was awarded topmost priority by the NAS World Food and Nutrition Study and has been selected for emphasis by the Board for International Food and Agricultural Development for funding under Title XII of the Foreign Assistance Act of 1975.

In brief, this research program will attempt to define or classify malnutrition in terms of the effects of various degrees of intake deficits on key biological functions and the consequences of these for society. To carry out this task the University will set up groups to organize a systematic approach to the selection and definition of specific activities within physiological and functional areas as they relate to marginal nutrient intakes. The areas to be considered will include but are not limited to the following:

1. Disease response which would cover morbidity, mortality, duration and severity of disease and rate of recovery. There is reason to believe that nutrition affects resistance and response of individuals to disease and therefore also influences the history of disease in a community.

Oct. 23-27 - California
 2. Reproductive competence which would include fertility and fecundity, lactation adequacy, partnering and parenting, infant survival, absence of birth defects and rate of growth and development. Nutritional status is known to affect sexual development and libido in both sexes, the outcome of pregnancy, birthweight of infants and thus their survival. Demographic consequences of these effects can be postulated.

3. Physical activity and work output which would cover productivity, discretionary activity, work capacity and fitness. Past and current food intake both may affect these functions.

Oct. 30 - Nov 3 - California
 4. Cognitive and sensory capacity covering school performance, perception, attention, receptivity, language, problem-solving, adaptability, vision, hearing, coordination and reaction time. Children from deprived environments have deficits in a number of measures but the role of nutrition *per se* is debated and there is essentially no information on adults.

Nov. 27 - Dec 1 - California
Social competence including interpersonal and intrafamilial behavior and community relationships. This is an almost uncharted area for study.

The planning project, when completed, will include recommendations for research projects; identification of participating institutions in the United States and developing countries which evidence interest in this research; determination of personnel who will be involved; establishment of budget requirements; and recommendations for a legal entity which will be responsible for administering the project.

Institutions that are interested in participating in this research program are requested to submit documentation of their interest and qualifications by June 15, 1978, to Dr. D. Calloway, 119 Morgan Hall, University of California, Berkeley, CA 94720. Documentation should include biographical data and complete publications lists of key personnel with demonstrated competency to engage in interdisciplinary research involving human subjects/populations, an indication of their intent to participate, a description of resources and facilities available for this research, and an indication of which of the proposed topics is of particular interest to the institution/consortium. Please do not submit a research plan or proposal.

TABLE 2
 RECIPIENTS OF NOTICE OF RESEARCH OPPORTUNITY
 UNDER USAID, TITLE XII: INTAKE & FUNCTION

Dr. R. Dennis Rouse, Dean
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 Auburn University
 Auburn, Alabama 36830

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 University of Alabama Medical Center
 Birmingham, Alabama 35294

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 Executive Vice President
 Alabama A&M University
 Normal, Alabama 35762

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 School of Applied Sciences
 Tuskegee Institute
 Tuskegee, Alabama 36088

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 Dean, School of Agriculture & Land
 Resources Management
 University of Alaska
 Fairbanks, Alaska 99701

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 College of Agriculture
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 Tucson, Arizona 85721

Dr. Herbert E. Carter
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 University of Arizona
 Tucson, Arizona 85721

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 Fayetteville, Arkansas 72701

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 Pine Bluff, Arkansas 71601

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 252 Mrak Hall
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 Davis, California 95616

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 munity Medicine
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 Santa Barbara, California 93107

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 Dept. of Psychology
 University of California, Santa Barbara
 Santa Barbara, California 93106

Dr. Reynaldo Martorell
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 Stanford University
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TABLE 5
 INSTITUTIONS WHICH HAVE SENT RESPONSES
 TO THE NOTICE OF RESEARCH OPPORTUNITY

California Polytechnic State University San Luis Obispo, California	Texas Tech University Lubbock, Texas
Colorado State University Fort Collins, Colorado	Tufts University Medford, Massachusetts
Cornell University Ithaca, New York	Tulane University New Orleans, Louisiana
Fundacion de Investigaciones de Ecologia Humana Cali, Colombia	The University of Arizona Tucson, Arizona
Iowa State University Ames, Iowa	University of California, Berkeley Berkeley, California
Kansas State University Manhattan, Kansas	University of California, Davis Davis, California
Lehigh University Bethlehem, Pennsylvania	University of California, Los Angeles Los Angeles, California
Massachusetts Institute of Technology Cambridge, Massachusetts	University of California, San Diego La Jolla, California
The Medical College of Wisconsin Milwaukee, Wisconsin	University of California, San Francisco San Francisco, California
Midwest Research Institute Kansas City, Missouri	University of Hawaii at Manoa Honolulu, Hawaii
North Carolina State University at Raleigh Raleigh, North Carolina	University of Illinois at Urbana-Champaign Urbana, Illinois
Oklahoma State University Stillwater, Oklahoma	The University of Kansas Medical Center Kansas City, Kansas
Oregon State University Covallis, Oregon	University of Minnesota Minneapolis, Minnesota
Furdue University West Lafayette, Indiana	University of Missouri, Columbia Columbia, Missouri
Southern Illinois University at Carbondale Carbondale, Illinois	The University of Nebraska, Lincoln Lincoln, Nebraska
Tennessee State University Nashville, Tennessee	The University of North Carolina at Chapel Hill Chapel Hill, North Carolina

University of the West Indies
Kingston, Jamaica, W.I.

University of Washington
Seattle, Washington

The University of Wisconsin
Madison, Wisconsin

Washington State University
Pullman, Washington

Virginia Polytechnic Institute and
State University
Blacksburg, Virginia

The University of Oklahoma Health
Sciences Center
Oklahoma City, Oklahoma

Institute of Nutrition, Mahidol Uni-
versity
Bangkok, Thailand

✓ New England Land Grant Universities
Durham, New Hampshire

University of Maryland
Princess Anne, Maryland

Steering Group

A steering group was selected in consultation with representatives of USAID to act in an administrative capacity and to be responsible for establishing research priorities, to nominate U.S. and foreign institutions to carry out the research designs proposed by the workshops, and to make final decisions regarding content and management of the proposed CRSP. The following people were chosen to represent diverse areas of competency:

Dr. Doris Calloway
Chairman, Department of Nutritional Sciences
University of California at Berkeley

Dr. Janine Galler
Department of Nutrition and Food Science
Massachusetts Institute of Technology

Pediatrician Psychiatrist

Dr. Lawrence Greene
Chairman, Department of Anthropology
University of Massachusetts

Dr. Alfred Harper
Department of Biochemistry
University of Wisconsin

Dr. Michael Latham
Division of Nutritional Sciences
Cornell University

Dr. Harold Sanstead
Director of Human Research Laboratory
Agricultural Research Service
U.S. Department of Agriculture
Grand Forks, North Dakota

clinical Nutritionist

Dr. Leonard Schuman
Chairman, Department of Epidemiology
School of Public Health
University of Minnesota

Epidemiologist

A letter was sent as of June 8 to each member of this group describing the program and the nature of their service. It included details

All have accepted

concerning the workshops, their purpose, the authors commissioned to write principal background papers, tentative workshop dates, and an invitation to attend as many of the workshops as they desire.

It will be necessary for the steering group to meet at least three or four times during the next ten months. We will try to schedule these meetings in August 1978 (to discuss U.S. institutions with the capacity to participate in the CRSP and site visits to these institutions), in December 1978 (to develop information for potential project proposals and to evaluate how research designs fit BIFAD/JRC criteria for a CRSP), and in May 1979 (to meet with probable research groups and to decide institutional arrangements). Additional meetings will be held in conjunction with workshops and, if indicated, in the period January - April, 1979.

Workshops

During September, October and November 1978 we are planning to hold workshops focusing on each of the five program areas. Each workshop will consist of twelve to sixteen people with relevant interests and experience from both biological and social science fields. The purpose of the workshops is to set forth the "state of the art"--to evaluate what is known or believed about the relation of each of these areas to nutritional intake--and to design a research approach aimed at defining the relationship of intake to functional competency. The purpose is not to debate whether or not a relationship exists, but to determine how to investigate the matter in an expeditious and quantitative manner. This would include determining criteria and methods to be

employed, assigning a priority to each facet of the research, and identifying locations where the research could be conducted. In short, the workshops are expected to develop research guidelines and specific project plans.

For each workshop, we have commissioned two principal background papers, one from the biological and one from the social science perspective. Table 4 contains a list of the proposed authors. At this point, Drs. Chandra, Field, Picou, Viteri, and Ratoosh have agreed to prepare papers; Dr. Bliss has tentatively agreed; and Dr. David Glass and Dr. Richard Easterlin both declined to write a paper from the social science perspective for the workshop on reproductive competence. Dr. Philip Payne also declined to write from the biological perspective for the social competence workshop; and Dr. Edward Foulks declined to write from the social science viewpoint for the workshop on cognitive ability. We have not yet had responses from Drs. Raj, Cravioto, and Mayer.

Letters were sent to the prospective authors of the principal background papers describing the purpose of the workshops and the nature of the subjects to be discussed in the papers. These instructions to the authors are summarized below. In general, each paper is expected to crystallize what is known or believed about the interaction of malnutrition (particularly marginal versus severe) with the program area (disease response, reproduction, work output, cognitive ability, or social competence). We hope that the authors will address the problem of how to differentiate nutritional from other environmental factors. The primary question to be confronted is: what difference does nutrition make to the experience and effects of disease, or reproduction, etc.

TABLE 4
AUTHORS OF PRINCIPAL BACKGROUND PAPERS;
BIOLOGICAL AND SOCIAL SCIENCE PERSPECTIVES

- I. Disease Response
Biological: R.K. Chandra, Memorial Univeristy of Newfoundland
Social: J.O. Field, Massachusetts Institute of Technology
- II. Reproductive Competence
Biological: D. Picou, University of the West Indies
Social: K.N. Raj, Center for Development Studies, Kerala, India
- III. Work Performance
Biological: F. Viteri, Institute of Nutrition of Central America
and Panama
Social: C.J. Bliss, Nuffield College, Oxford
- IV. Cognitive and Sensory Ability
Biological: J. Cravioto, National Institute of Child's Health Sci-
ence and Technology, Mexico
Social: E. Foulks, University of Pennsylvania
- V. Social Competence
Biological: J. Mayer, Tufts University
Social: P. Ratoosh, Psychiatric Consultant, Berkeley, California

The background papers for the disease response program area should cover the effects of malnutrition on the various immune responses in addition to the effects on the disease state itself (chronic disease, infections, immunization). It should consider the full spectrum of health/disease including such subjects as aging and cancer. The paper to be written from the social sciences perspective is particularly challenging and will require considerable resourcefulness. This paper should include a discussion of what is known about the effects of nutrition↔ disease on mortality, community/group morbidity, demographic characteristics, political awareness and participation, occupational productivity, family patterns, and social institutions.

The background papers for the workshop on reproductive competency should discuss how food energy intake affects demography at community and national levels. Clearly, it will have an impact through its effects on disease resistance and recovery and other mechanisms. A most important topic is the measures by which reproductive competency might be assessed. The paper should emphasize the many possible determinants of reproduction rates and the limits to the role of reproductive competency in governing these as well as the limits to the role of intake as only one of the determinants of reproductive competency. Perhaps the major contribution of the background paper will be to set the relationship between intake and reproduction in a proper perspective and within the context of the larger system of forces governing reproduction rates.

The papers to be written for the workshop on work performance should cover an evaluation of the literature concerning productivity, discretionary activity, work capacity, and fitness. In particular, the social

science viewpoint might examine income and wealth in a community and its allocation within the community as this is linked to the work performance of different individuals at different times. It might also include how one can take account of uncompensated labor (household and community). One good focus for this discussion may be the issue of what it is that should be taken as performance measure(s) of physical activity and work output. This may be presented in the context of an attempt to identify alternative perceptions of systems relating intake to physical activity and work output. There is a problem in that, while we are concerned broadly with the relationship between intake and function, the link with intake may be both direct (the consequence of being undernourished) and indirect (the experience of past hunger affecting present attitudes, expectations and decisions). In addition, we would expect this system to be recursive: output affects intake which in turn affects output. This may be true not only from year to year but also in the longer term as body size is affected by intake through the growing period and in turn affects the amount of energy available to the adult after body maintenance. In subsistence farming situations, the likelihood of crop failure may affect choice of crops and palatability may be sacrificed for reliability. Unpalatability may also limit intakes and available energy. Such a hypothetical relationship indicates the need for the background paper to consider both wider and longer-term ramifications of interrelationships and not simply the direct link between food intake and the consequent level and quality of work output. The paper might also consider the relationship between food intake and work output as this is mediated by disease, including parasites.

Another topic which should be considered for discussion by this workshop is that of the determinants of voluntary and involuntary allocation of energy output between different activities and growth or body-weight maintenance.

The papers for the workshop on cognitive and sensory capacity would cover such areas as school performance, perception, attention, language, problem-solving, adaptability, vision, hearing, coordination, etc. They would also entail a discussion of research methodologies and the presentation of potential research strategies to elucidate this interaction quantitatively.

The background papers to be prepared for the workshop on social competency present perhaps the most difficult challenge. They will have to take account of the identification of measures by which social competence might be assessed. This might entail the identification of various roles (e.g., parent, spouse, breadwinner, homemaker, kin group member, work group member, social group member, etc.) through which social competence is expressed and the review of different approaches to the measurement of performance in these various roles. Obviously, role performance is determined by many factors of which malnutrition is only one. The paper should develop an initial perception of this system of determinants so that a basis is provided for the identification of the role of nutrition and for exploring the possibilities of valid isolation of key relationships for further research.

We requested that the background papers be received by us no later than two weeks prior to the particular workshop so that there will be time to send them to the participants in advance of the workshop.

We have scheduled the workshop on disease response for September 25-29. In addition to Drs. Chandra and Field, the following people have agreed to participate and are free at this time: Dr. George Beaton (Chairman, Nutrition Department, University of Toronto), Dr. Morton Grossman (Wadsworth Veterans' Hospital, University of California at Los Angeles), Dr. Hans Popper (tentative; Mt. Sinai School of Medicine, New York), and Dr. Moises Behar (Director of Nutrition, World Health Organization). Dr. S.G. Srikantia (Director, Nutrition Division, Indian Council for Medical Research, Hyderabad) is unable to make this date. We are trying to contact Dr. Peter Greenwald (Epidemiologist and Director of Cancer Control Bureau, New York State Department of Health). We also hope to have the participation of at least Drs. Galler and Sanstead of the steering committee. This list is incomplete at present.

The workshop on work performance has been scheduled for October 30-November 3. In addition to Drs. Viteri and Bliss, the participants will be Dr. Samir Basta (The World Bank, Washington, D.C.), Dr. Michael Latham (Professor of International Nutrition, Cornell University), Dr. Katarina Borner (Department of Physical Education, University of Michigan), Dr. Edward Montgomery (Chairman, Anthropology Department, Washington University), Dr. Ellsworth Buskirk (Director, Human Performance Laboratory, Pennsylvania State University), Dr. Nemat Borhani (Chairman, Department of Community Health, University of California at Davis, School of Medicine) and Mr. Stanley Parker (tentative; Principal Social Survey Officer, Office of Population Censuses and Surveys, London, England). Again, at this point this list is still incomplete.

A tentative agenda has been prepared for conducting the workshops. On the first day, a chairman and a rapporteur will be elected, criteria for the research will be discussed, and the background papers will be reviewed. The second and third days will consist of discussions of research design and problems and a drafting group will be selected to prepare the final report consisting of the proposed research design plan and specific project plans. On the fourth day, the group will discuss project priorities, potential institutions, and the timetable for research. On the fifth day they will review the report and make their final recommendations.

Personnel

Christina Wood (Ph.D., University of California at Berkeley) was hired as Coordinator/Administrator to assist Dr. Doris Howes Calloway. Heather Ture was chosen for the secretarial position.

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In July and August, arrangements for the workshops will be finalized (location, accommodations, travel arrangements) and the list of participants will be completed. Background information will be sent to the participants and references will be collected and made available at the workshops. The workshops will be held in September, October and November.