

9310579 (B)  
PD-AIF-545

NO DESIGN DOCUMENT

(Project summaries/abstracts developed from

PRO AGs, PIOTs, and PARs)

9310579 (3)  
PD-ALF-545

49

DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON, D.C. 20523

CERTIFIED & TRUE COPY THIS  
5th DAY OF July 1972  
BY E. J. Anis

Massachusetts Institute of Technology  
Division of Sponsored Research  
Cambridge, Massachusetts 02239

Subject: Amendment No. 2  
Contract No. AID/csd-2808

Pursuant to the authority contained in the Foreign Assistance Act of 1961, as amended, and Executive Order No. 11223, subject contract is hereby further amended as follows:

The COVER PAGE, Accounting and Appropriation Data is amended by adding the following:

- "PIO/T No. 931-17-560-519-73-3127630;
- Appropriation No. 72-1121006;
- Allotment No. 256-31-099-00-22-21;
- Project No. 931-17-560-519".

ARTICLE I - STATEMENT OF WORK is amended by adding paragraph C.

"C. Scope of Work (continued)

1. The Contractor shall study the effect of caloric intake provided at breakfast. The purpose will be to evaluate the extent to which the caloric component of the breakfast is important in determining the overall utilization of the daily protein supply when dietary caloric intake is limiting.
2. The Contractor shall determine whether the findings with lysine supplementation also apply to other limiting essential amino acids. It is planned to carry out a study comparable in design to those of the lysine-wheat gluten experiments dealing with the effects of methionine supplementation of chickpeas (chickpeas which are deficient in methionine will be sole protein source) at adequate and inadequate caloric intake."

ARTICLE IV - REPORTS is amended by adding paragraph E. as follows:

"E. The Contractor shall prepare the final detailed report specified in paragraph C. of ARTICLE IV in the format proscribed by the Guidelines for Preparation of the Research Annual Report dated January 20, 1972 incorporated herein as ATTACHMENT A. This report shall be provided in 100 copies within 3 months after completion of the project."

ARTICLE VI - ESTIMATED COST AND OBLIGATED FUNDS is amended by deleting "\$164,834" and inserting in lieu thereof "\$290,060".

ARTICLE VII - BUDGET, the BUDGET is amended to read as follows:

"BUDGET

Category	Actual and Estimated Cost	Actual and Estimated Cost	Estimated Cost	Total Estimated Cost
	Fr: 6/30/70 To: 6/30/71	Fr: 7/1/71 To: 3/31/72	Fr: 4/1/72 To: 6/30/73	Fr: 6/30/70 To: 6/30/73
Salaries and Wages	\$45,520	\$36,792	\$ 62,585	\$144,897
Employee Benefits	6,464	5,886	10,264	22,614
Overhead	23,215	19,872	32,669	75,756
Travel	300	225	375	900
Supplies	7,150	5,364	11,103	23,622
Subject Costs	7,125	5,345	7,125	19,595
Other Direct Costs	900	676	1,100	2,676
<b>TOTAL</b>	<u>\$90,674</u>	<u>\$74,160</u>	<u>\$125,226</u>	<u>\$290,060</u>

TOTAL MOUNT OBLIGATED \$290,060."

ARTICLE IX - ESTABLISHMENT OF OVERHEAD RATE is amended by changing the provisional rate from "51%" to "52.2%"; changing the Base from "Salaries & Wages" to "Direct Salaries & Wages including overtime premium, sick leave, holiday time"; and changing the Period from "July 1, 1970 to June 30, 1971" to "July 1, 1970 until amended".

ARTICLE XI - ADDITIONAL CLAUSES is hereby amended as follows:

Paragraph A., the clause entitled Clinical Studies is hereby deleted and the following is substituted in lieu thereof:

"A. The clause entitled Protection of the Individual as a Research Subject is incorporated herein as ATTACHMENT B."

Paragraph G., the clause entitled Termination for the Convenience of the Government is amended by revising paragraph (d) to read as follows:

Paragraph d., Any determination of costs under paragraph (c) shall be governed by the contract cost principles and procedures in Subpart 1-15.3 of the Federal Procurement Regulations (41 CFR 1-15.3) in effect on the date of this contract, except that if the Contractor is not an educational institution any costs claimed, agreed to, or determined pursuant to paragraphs (c) or (e) hereof shall be in accordance with Subpart 1-15.2 of the Federal Procurement Regulations (41 CFR 1-15.2) in effect on the date of this Contract."

Paragraph K. is added as follows:

"K. Pre-amendment Costs

The allowable cost of performance of this contract amendment shall include all allowable and allocable costs which have been incurred by the Contractor in anticipation of this contract on and after April 1, 1972, but prior to the execution date hereof, and which, if incurred after such date, would have been considered as items of allowable and allocable costs under Article VIII of the Schedule of this Contract; provided, however, that such pre-contract costs shall not exceed \$27,000 unless such amount is subsequently increased in writing by the Contracting Officer."

Paragraph L. is added as follows:

"L. The clause entitled Notice of Maximum Permissible Escalation in Wage & Price Standards is hereby added as ATTACHMENT C."

Paragraph M is added as follows:

"M. The following general provisions of this contract are hereby amended by attachments hereto as follows:

General Provision

ATTACHMENT

Travel and Transportation Expenses

D

Reports

D

Price Reduction for Defective  
Cost or Pricing Data

E

Utilization of Labor Surplus  
Area Concerns

F"

Paragraph N is added as follows:

"N. The following general provisions are hereby added, numbered, and attached heretofas follows:

General Provision

Number

Price Certification

51

Utilization of Minority Business Enterprises

52

Listing of Employment Openings

53"

Except as expressly hereby amended, said contract remains in full force and effect in accordance with its terms.

ACCEPTED:

MASSACHUSETTS INSTITUTE  
OF TECHNOLOGY

BY

*Paul V. Cusick*

PRINTED NAME PAUL V. CUSICK

Vice President for Business  
and Fiscal Relations

TITLE

DATE

JUN 28 1972

UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT

BY

*N. A. Caticchio*

PRINTED NAME N. A. Caticchio

TITLE Contracting Officer

DATE

JUN 29 1972

APPROVED

ORIGINAL

9310579 (4)  
PO-AAF-545

DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON, D.C. 20523

FUNDS AVAILABLE 6p

Date February 28, 1973  
Contract No. 931-17-560-519-73  
Object Class 3137632  
Allotment 354-31-099-00-22-31  
Project No. 931-17-560-519  
By (initials) [Signature]  
AID/CONT./CO/MAR

Massachusetts Institute of Technology  
Division of Sponsored Research  
Cambridge, Massachusetts 02139

Subject: Amendment No. 5 to  
Contract No. AID/csd-2808

Pursuant to the authority of the Foreign Assistance Act of 1961,  
as amended, and Executive Order No. 11223, the subject contract  
as amended, is hereby further amended as follows:

A. COVER PAGE. The cover page is amended as follows:

1. The contract amount is increased from "\$290,060" to "\$334,932".
2. The following accounting and appropriation data is added:

"PIO/T No. 931-17-560-519-73-3137632 (\$44,872)  
Appropriation No. 72-1131004  
Allotment No. 354-31-099-00-22-31  
Project No. 931-17-560-519"

B. GENERAL PROVISIONS. The General Provisions Form CT/GP/R&D, 3-67,

Supplements No. 2 dated May '69 and Supplement No. 4 dated  
November 1970 are deleted in their entirety and in lieu thereof  
General Provision Form AID 1420-41C (7-72) (Att. A) and Additional  
General Provisions Form AID 1420-41D (7-72) (Att. B), As amended  
by Article XI, are substituted. All references to the General  
Provisions in this contract shall be amended to reflect the fore-  
going. The following listing of General Provisions clauses shall  
replace the listing included in the contract's table of contents:

ORIGINAL

"GENERAL PROVISIONS (AID 1420-41C)

INDEX OF CLAUSES

1. Definitions
2. Changes
3. Biographical Data
4. Leave and Holidays
5. Travel and Transportation Expenses
6. Standards of Work
7. Inspection
8. Limitation of Cost
9. Allowable Cost, Fixed Fee, and Payment
10. Negotiated Overhead Rates
11. Assignment of Claims
12. Examination of Records
13. Price Reduction for Defective Cost or Pricing Data
14. Audit and Records
15. Subcontractor Cost and Pricing Data
16. Reports
17. Source Requirements of Procurement of Equipment, Vehicles, Materials, Supplies, and Services
18. Subcontracts and Purchase Orders
19. Government Property
20. Utilization of Small Business Concerns
21. Utilization of Labor Surplus Area Concerns
22. Insurance-Liability to Third Persons
23. Termination for Default or for Convenience of the Government
24. Excusable Delays
25. Stop Work Order
26. Disputes
27. Authorization and Consent
28. Notice and Assistance Regarding Patent and Copyright Infringement
29. Patent Provisions and Publication of Results
30. Rights in Data
31. Release of Information
32. Equal Opportunity
33. Convict Labor
34. Walsh-Healey Public Contracts Act
35. Officials Not to Benefit
36. Covenant Against Contingent Fees
37. Language, Weights and Measures
38. Security Requirements
39. Utilization of Minority Business Enterprises
40. Listing of Employment Openings
41. Notices"

"ADDITIONAL GENERAL PROVISIONS (AID 1420-41C)

INDEX OF CLAUSES

1. Definitions
2. Leave and Holidays
3. Travel and Transportation Expenses
4. Title to and Care of Property
5. Marking
6. Personnel
7. Allowances
8. Conversion of United States Dollars to Local Currency
9. Orientation and Language Training
10. Insurance-Workmen's Compensation, Private Automobiles, Marine and Air Cargo
11. Services Provided to Contractor
12. Miscellaneous
13. Contractor-Mission Relationships
14. Notice of Changes in Regulations "

C. ARTICLE I - STATEMENT OF WORK. Article I is amended by adding the following paragraph C:

"C. Scope of Work (continued). During the period of this contract extension, the contractor shall investigate several of the alternative protein sources used by people in the IDC to confirm that wheat, the protein of the earlier experiment, is typical and not an exception to the finding which demonstrates limitations in using a single Biological Value estimate for evaluating protein quality and, in turn, causes gross misestimates of the protein requirement for persons consuming a major amount of their protein from cereal sources."

D. ARTICLE III - KEY PERSONNEL. Article III is amended by increasing the man-months estimated for performance of this contract for the following listed personnel:

Assistant Professor of Physiological Chemistry	5 Man-Months
Dietician	45 " "
Technical Assistant	42 " "
Statistical Clerk	24 Man-Months

E. ARTICLE IV - REPORTS. Article IV is amended by adding paragraph F as follows:

"F. The Contractor shall prepare an Annual Report in the format prescribed by the Guidelines for Preparation of the Research Annual Report dated January 20, 1972 which was incorporated into the provisions of this contract by Amendment No. 2. This annual report shall be submitted in 20 copies within forty-five days after anniversary date of contract."

F. ARTICLE V - PERIOD OF CONTRACT. Article V is amended to change the estimated completion from "thirty-six (36)" to "forty-five (45)" months.

G. ARTICLE VI - ESTIMATED COST AND OBLIGATED FUNDS. Article VI is amended to change the total estimated cost of this contract from "\$290,060" to "\$334,932".

H. ARTICLE VII - BUDGET. Article VII is amended to change the budget figures to read as follows:

"BUDGET"  
(6/30/70 - 3/30/74)

<u>"Category"</u>	Actual Expenditures 6/30/70-12/31/72	Estimated Expenditures 1/1/73-6/30/73	Estimated Expenditures 7/1/73-3/30/74	Total Estimated Cost
"Salaries and Wages	\$ 115,954	\$ 24,484	\$ 17,972	\$ 158,410
Employee Benefits	18,280	4,187	3,074	25,541
Operating Expenses	44,539	8,235	13,414	66,188
Equipment	1,722	- 0 -	- 0 -	1,722
Overhead	59,927	12,732	10,412	83,071
Totals	\$ 240,422	\$ 49,638	\$ 44,872	\$ 334,932"

I. ARTICLE IX - ESTABLISHMENT OF OVERHEAD RATE. Article IX is amended to add the following provisional rates for the periods indicated:

<u>"Period"</u>	<u>On-Campus Rate</u>	<u>Base</u>
"7/1/72-6/30/73	54%	Direct Salaries and Wages*
"7/1/73-6/30/74	58%	Direct Salaries and Wages*

\*Including overtime premium, sick leave, holiday time and jury time."

J. ARTICLE XI - ADDITIONAL CLAUSES AND ALTERATIONS TO GENERAL PROVISIONS. Article XI is amended as follows:

1. Paragraph G of Article XI is deleted in its entirety and the following substituted in lieu thereof:

"G. Delete General Provision Clause No. 23 and substitute in lieu thereof Attachment C hereto entitled: Termination for the Convenience of the Government."

2. Paragraph H of Article XI is deleted in its entirety and the following substituted in lieu thereof:

"H. Delete paragraph (b) (2) of General Provisions Clause No. 29 entitled Patent Provisions and Publication of Results."

3. Paragraph I of Article XI is deleted in its entirety and the following substituted in lieu thereof:

"I. Delete General Provision No. 30 and substitute in lieu thereof Attachment D hereto entitled: Rights in Data and Publication."

4. Paragraph J of Article XI is deleted in its entirety since the clause concerning Equal Opportunity is set forth in attachment A hereto, in General Provision 32.

5. Paragraphs O through T to Article XI are hereby added as follows:

"O. General Provision 54 entitled: Payment of Interest on Contractor's Claims, attachment E, hereby incorporated into the provisions of this contract.

"P. General Provision 25 entitled: Stop Work Order is hereby deleted from the provisions of this contract.

"Q. General Provisions 31 entitled: Release of Information is hereby deleted from the provisions of this contract.

"R. General Provisions No. 52 and 53 added by Amendment No. 2 are deleted in their entirety since these clauses are contained in Attachment A hereto in General Provision No. 39 and 40, respectively.

"S. General Provision 9 is amended to delete the requirement for submission of accounting back-up in support of vouchers.

"T. General Provision 5 is amended to change the words contained in the sixth line from 'and continuous' to 'and not continuous'."

Except as herein expressly amended subject contract remains unchanged.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT

BY: *Stuart H. Cowen*

BY: *V. C. Perelli*

PRINTED NAME: Stuart H. Cowen

PRINTED NAME: V. C. Perelli

TITLE: Comptroller

TITLE: Contracting Officer

DATE: February 28, 1973

DATE: February 28, 1973

APPROVED \_\_\_\_\_

PI-AAF-545

93105196

AID 1350-1X  
(7-71)  
  
PIO/T

DEPARTMENT OF STATE  
AGENCY FOR  
INTERNATIONAL DEVELOPMENT  
  
PROJECT IMPLEMENTATION  
ORDER/TECHNICAL  
SERVICES

1. Cooperating Country  
No. Includes 157439  
2. PIO/T No.  
931-11-560-519-73  
4. Project/Activity No. and Title  
Relation of Dietary Caloric Intake to Protein  
Utilization in Man  
AID/csd-2808

Page 1 of 4 Pages  
3.  Original or  
Amendment No. 51

DISTRIBUTION

5. Appropriation Symbol  
72-11X1023  
7. Obligation Status  
 Administrative Reservation  Implementing Document  
9.A. Services to Start (Mo., Day, Yr.)  
Between 10/1/74 and 9/30/75  
10.A. Type of Action  
 A.I.D. Contract  Cooperating  
Country Contract  Participating Agency  
Service Agreement  Other  
10.B. Authorized Agent

6.A. Allotment Symbol and Charge  
402-31-099-00-22-51  
6.B. Funds Allotted to:  
 A.I.D./W  Mission  
B. Funding Period (Mo., Day, Yr.)  
From 10/1/74 To 9/30/75  
9.B. Completion date of Services  
(Mo., Day, Yr.) 9/30/75

Estimated Financing		(1)	(2)	(3)	(4)
		Previous Total	Increase	Decrease	Total to Date
11.					
Maximum A.I.D. Financing	A. Dollars		24,946		24,946
	B. U.S.-Owned Local Currency				
12. Cooperating Country Contributions	A. Counterpart				
	B. Other				

FUNDS RESERVED BY  
  
POSTED  
  
SER/EM/CSD

13. Mission  
References

14. Instructions to Authorized Agent  
  
The purpose of this PIO/T is to authorize \$24,946 for the extension of this project. The extension will cover conducting additional research activities that have been recommended by two experts as important to the proper completion of this project contract.

15. Clearances - Show Office Symbol, Signature and Date for all Necessary Clearances.

A. The specifications in the scope of work are technically adequate  
  
TA/N, Samuel G. Kahn  
  
C. The scope of work lies within the purview of the initiating and approved Agency Programs  
  
TA/N, Martin J. Forman (Director)  
  
E.  
  
TA/N, Amy Pound

B. Funds for the services requested are available  
  
TA/PM, J. M. Ryan  
  
D.  
  
TA/RIG, M. Reichel  
  
TA/EM, R. Morynski  
TA/EM, C. Wolfetto

16. For the cooperating country: The terms and conditions set forth herein are hereby agreed to  
  
Signature and date:  
  
Title:

17. For the Agency for International Development  
  
Signature: John Cunning  
  
Title: Chief, TA/PM

18. Date of Signature

UNITED STATES GOVERNMENT

# Memorandum

: CM/COD/TAB, Virginia Perelli

DATE: November 12, 1974

FROM : TA/N, Samuel G. Kahn 

SUBJECT: Extension of Contract AID/csd-2808 /Relation of Dietary Calorie Intake to Protein Utilization in Man, MIT/

This project was reviewed July 25, 1974 by two experts in the field of protein nutrition, Dr. A. Harper, University of Wisconsin and Dr. S. Margen, University of California, Berkeley. Their report is attached. Both experts agree that the research conducted by MIT has met the goals of the project as originally outlined. However, Drs. Harper and Margen recommend that a specific part of the project, regarding the utilization of wheat protein, by human subjects, be extended in order that measurements can be made on subjects with intakes at or near the protein requirement for nitrogen equilibrium. This new work should permit a reliable assessment of the variability of requirements, of efficiency values for protein, and test the reliability of the regression technique for determination of protein quality.

The outcome of the experts' review was the instruction to MIT to submit a proposal for a twelve month extension of support for the project (Contract - AID/csd-2808). The new proposal was received the first week of October. Unfortunately, the existing contract was permitted to lapse beyond its completion of service date, September 30, 1974. All invoices have not been issued by the contractor and a final contract release has not been made. TA/N requests that this project contract be continued as of October 1, 1974 to September 30, 1975. The total estimated cost for continuing this extension is \$24,946. Attached to this memorandum are the P10/T for extending this contract, a copy of the proposal for extension, and a copy of the experts' report.



AID 1340-1X 19-701	Cooperating Country Worldwide	PIO/T No. 931-17-560-519	Page 2 of 4 Pages
PIO/T	Project Activity No. and Title Relation of Dietary Calorie Intake to Protein Utilization in Man AID/csd-2808		

**SCOPE OF WORK**

**19. Scope of Technical Services**

**A. Objective for which the Technical Services are to be Used To** provide needed information regarding the minimum protein needs of adult men and the meaning and significance of protein quality in human nutrition.

**B. Description**

The dietary protein levels to be evaluated will be equivalent to about (Nitrogen X 6.25) 0.65, 0.8, 0.95 and 1.2 g. whole wheat protein/kg./day. The whole wheat protein will be the same used in the original study (25 mg. Nitrogen/g.; 99% extraction).

Modification of the above range of nitrogen intake can be made if the upper levels of whole wheat intake proposed is too great for a subject.

Eight subjects will be studied at each protein level. Each diet period will last 15 days. Each subject will be studied during a minimum of two dietary periods. A five day break will be given between each diet period. The order in which the dietary protein levels are presented to the subjects will be randomized wherever possible.

Metabolic Nitrogen balance techniques will be employed. Blood analyses, including protein, albumin free amino acid levels, SGOT, SGPT and GGTP will be conducted.

**C. Technicians**

(1) (a) <u>Number</u>	(b) <u>Specialized Field</u>	(c) <u>Grade and/or Salary</u>	(d) <u>Duration of Assignment (Man-Months)</u>
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(2) **Duty Post and Duration of Technicians' Services** (N.A.)

(3) **Language requirements**

(4) **Access to Classified Information**

(5) **Dependents**    | | Will    | | Will Not    **Be Permitted to Accompany Technician**

**D. Financing of Technical Services**

(1) **By AID - \$ 24,946**

(2) **By Cooperating Country ..**

AID 1350-1X 19-701	Cooperating Country Worldwide	PIO/T No. 931-17-560-519-	Page 3 of 4 Pages
PIO/T	Project/Activity No. and Title Relation of Dietary Calorie Intake to Protein Utilization in Man AID/csd-2808		

20. Equipment and Supplies (Related to the services described in Block 19 and to be procured outside the Cooperating Country by the supplier of these services)

A. (1) Quantity	(2) Description	(3) Estimated Cost	(4) Special Instructions
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N.A.

B. Financing of Equipment and Supplies

(1) By AID - \$

(2) By Cooperating Country -

21. Special Provisions

- A. This PIO/T is subject to AID (contracting) (PASA implementation) regulations.
- B. Except as specifically authorized by AID, or when local hire is authorized under the terms of a contract with a U.S. Supplier, services authorized under this PIO/T must be obtained from U.S. sources.
- C. Except as specifically authorized by AID/W, the purchase of commodities authorized under this PIO/T will be limited to the U.S. under Geographic Code 000.
- D. Other (specify):

N.A.



Technical Assistance Bureau

Major Types of Activity Development of Highly Nutritious Low-Cost Food Products

Project Title Relation of Dietary Caloric Intake to Protein Utilization in Man

Project Number 931-17-560-519 9-15-70 10-10-70

Name of Contractor Massachusetts Institute of Technology Contract No. AID/csd-2808

Starting Date Obligation June 1970 Termination Funding FY '72  
Work June 1970 Date work June 1973

Project Monitor Irwin Hornstein Extension 29771

Funding Data  
(in thousands)

	U.S. Contribution		
	Oblig.	Expend.	Unliquidated
Cumulative through 6/30/69	0		
FY 1970	91		
FY 1971	97		
FY 1972	140		

Project Target and Course of Action

To establish the relationship between dietary caloric intake and protein utilization in man. If protein serves only as a source of calories when caloric intake is low, adding high cost amino acids or protein foods to inadequate caloric diets is wasteful. This study should provide the answers to how well protein is utilized when dietary calories are low.

The project is divided into three sub-studies. Part I will study the effect on nitrogen utilization of adding lysine to a low protein diet when ingested calories are low. Part II will study the quantitative relationship between restricted caloric intake and the utilization of dietary protein. Part III will study the effect on nitrogen utilization of giving a protein supplement at different times of the day when caloric intake is limiting.

M.I.T. male students will be used as the subject in these studies.

Accomplishments to Date

Not Available.

FY 72 Program and Future Targets

To verify, if considered necessary, results obtained in this study on malnourished infants and children

AMENDMENT OF CONTRACT/ORDERS IDENTIFICATION OF CONTRACT

Amendment No. 7  
 DATED 4-30-75  
 PROJECT NO. 17-000-610-73-315729  
 AGENCY FOR INTERNATIONAL DEVELOPMENT  
 Office of Contract Management  
 Central Operations Division  
 Washington, D. C. 20523  
 FUNDS OBLIGATED  
 93105197  
 PD-AAF-545

CONTRACTOR NAME AND ADDRESS: Mr. C. Frederick Bentley, II, Massachusetts Institute of Technology, Office of Sponsored Research, 77 Massachusetts Ave. Room E19-702, Cambridge, Mass. 02139  
 AMENDMENT OF CONTRACT/ORDER NO. AID/csd-2803  
 DATED 6-30-70 (See blank 11)

10. ACCOUNTING AND APPROPRIATION DATA (If required)  
 Allotment: 402-57-059-00-22-51  
 Appropriation: 72-11X1023  
 Charge \$24,946

11. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS  
 (a) The above numbered contract/order is modified to refer to the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 12.  
 (b) This Supplemental Agreement is entered into pursuant to authority of F.A. Act of 1961, as amended, and E.O. 11723

12. DESCRIPTION OF AMENDMENT/MODIFICATION  
 Cover Page - The contract amount is increased by \$24,946 from \$334,932 to \$359,878.  
 Table of Contents - General Provisions - The General Provisions and Additional General Provisions dated 7-72 are deleted and the attached General Provisions and Additional General Provisions dated 9-74 are substituted in lieu thereof.  
 Article I - Statement of Work - The attached proposal for an extension of the basic contract entitled "Relation of Dietary Caloric Intake to Protein Utilization in Man", which was submitted to the Office of Nutrition by Drs. Nevin S. Scrinshaw and Vernon R. Young, constitutes the statement of work for this amendment. In summary, it is the following:

EXCEPT AS PROVIDED HEREIN, ALL TERMS AND CONDITIONS OF THE DOCUMENT REFERENCED IN BLOCK 8, AS HEREIN SET FORTH, REMAIN UNCHANGED AND APPLICABLE TO THIS OFFER.  
 CONTRACTOR/ORDER IS NOT REQUIRED TO SIGN THIS DOCUMENT  
 CONTRACTOR/ORDER IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 7 COPIES TO ISSUING OFFICE  
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
 UNITED STATES OF AMERICA Agency for International Development  
 Signature of person authorized to sign: Stuart H. Coven  
 Signature of Contracting Officer: [Signature]  
 DATE: MAY 28 1975

A. Objective

To provide needed information regarding the minimum protein needs of adult men and the meaning and significance of protein quality in human nutrition.

B. Description

The dietary protein levels to be evaluated will be equivalent to about (Nitrogen X 6.25) 0.65, 0.8, 0.95 and 1.2 g. whole wheat protein/kg./day. The whole wheat protein will be the same used in the original study (25 mg. Nitrogen/g.; 99% extraction). Modification of the above range of nitrogen intake can be made if the upper levels of whole wheat intake proposed is too great for a subject.

Eight subjects will be studied at each protein level. Each diet period will last 15 days. Each subject will be studied during a minimum of two dietary periods. A five day break will be given between each diet period. The order in which the dietary protein levels are presented to the subjects will be randomized wherever possible.

Metabolic Nitrogen balance techniques will be employed. Blood analyses, including protein, albumin free amino acid levels, SGOT, SGPT and GGTP will be conducted.

Article III - Key Personnel

In performance of this Amendment No. 6, the following approximate amount of their time will be devoted by key personnel:

Principal Investigator

5%

MAN MONTHS  
.45

MAN MONTHS

Co-Principal Investigator	10%	.90
Dietician	25%	2.25
M.D. Research Assistant	50%	4.50
Technician	40%	3.69

ARTICLE V - Period of Contract - Delete the estimated completion of 45 months and substitute 67 months therefor.

Article VI - Estimated Cost - Delete the amount of \$331,932 and substitute \$359,878 therefor.

Article VII - Budget - Delete the Budget set forth in Amendment No. 5 and substitute the following:

<u>Category</u>	<u>Amendment 7</u> <u>7-1-74 - 31-31-76</u>	<u>Total</u>
Salaries & Wages	\$ 7,363	\$165,773
Employee Benefits	1,421	26,962
Operating Expenses	-	66,188
Supplies & Equipment	1,100	2,822
Overhead	4,822	87,893
Subject Costs	<u>10,240</u>	<u>10,240</u>
	\$334,932	\$359,878

Article IX - Establishment of Overhead Rate - The following provisional overhead rate is established from 7-1-74 until amended:

<u>Rate</u>	<u>Base</u>
65.5%	Direct Salaries & Wages

93105748  
FD-AAF-545

9519

COST AND REIMBURSEMENT CONTRACT FOR RESEARCH AND DEVELOPMENT

AGENCY FOR INTERNATIONAL DEVELOPMENT  
NEGOTIATED CONTRACT NO. AID/csd-2802

CONTRACT TYPE  
Cost Reimbursement

REGULATED PURCHASE TO THE FOREIGN  
ASSISTANCE ACT OF 1961, AS AMENDED,  
AND EXECUTIVE ORDER 11803

AMOUNT

\$290,000

14p

CONTRACT FOR

Relation of Dietary Caloric Intake to Protein Utilization in Man

ISSUING OFFICE (NAME AND ADDRESS)

CONTRACTOR (NAME AND ADDRESS)

Agency for International Development  
Office of Procurement  
Contract Services Division  
Washington, D. C. 20523

Massachusetts Institute of Technology  
Division of Sponsored Research  
Cambridge, Massachusetts 02139

ADMINISTRATION BY

COGNIZANT SCIENTIFIC/TECHNICAL OFFICE

Issuing Office

Technical Assistance Bureau  
Office of Nutrition

MAIL VOUCHERS (Original & 3 copies)

ACCOUNTING AND APPROPRIATION DATA

TO: Agency for International Development  
Office of the Controller  
Washington, D. C. 20523

FIC/1 NO. 131-17-300-519-73-3108711

APPROPRIATION NO. 72-1102008

ALLOCATION NO. 056-32-000-00-00-017

TYPE OF VOUCHERS (CHECK APPROPRIATE BOX(ES))

STATEMENT OF WORK

STATE PUBLISHED

PATENT RIGHTS

DECA RIGHTS

STATE WORK

X LEGALLY DRAFTED IN THE STATE OF MASSACHUSETTS

The United States of America, hereinafter called the Government, represented by the Contracting Officer executing this contract, and the Contractor agree that the Contractor shall perform all the services set forth in the attached Schedule, for the consideration stated therein. The rights and obligations of the parties to this contract shall be subject to and governed by the Schedule and the General Provisions. To the extent of any inconsistency between the Schedule or the General Provisions and any specifications or other provisions which are made a part of this contract, by reference or otherwise, the Schedule and the General Provisions shall control. To the extent of any inconsistency between the Schedule and the General Provisions, the Schedule shall control.

This Contract consists of this Cover Page, the Schedule of 24 Pages, including the Table of Contents, the General Provisions (Form CF/CP/12D 3-67) and Supplement No. 2 dated May 1969.

NAME OF CONTRACTOR

UNITED STATES OF AMERICA

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

AGENCY FOR INTERNATIONAL DEVELOPMENT

BY (Signature of Authorized Individual)

BY (Signature of Contracting Officer)

TYPED CONTRACTOR NAME

TYPED CONTRACTOR NAME

Stuart H. Cowen

F. T. Moncada

TITLE  
COMPTROLLER

CONTRACTING OFFICER

DATE  
JUN 29 1970

DATE  
JUN 30 1970

PREPARED ON PAGE 524

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SCHEDULE

The Schedule, on pages 1 through 24, consists of this Table of Contents and the following Articles

ARTICLE I	- STATEMENT OF WORK	ARTICLE VII	- BUDGET
ARTICLE II	- TECHNICAL DIRECTIONS	ARTICLE VIII	- COSTS REIMBURSABLE
ARTICLE III	- KEY PERSONNEL	ARTICLE IX	- ESTABLISHMENT OF OVERHEAD RATES
ARTICLE IV	- REPORTS	ARTICLE X	- PERSONNEL COMPENSATION
ARTICLE V	- PERIOD OF CONTRACT	ARTICLE XI	- ADDITIONAL CLAUSES AND ALTERATIONS TO THE GENERAL PROVISIONS
ARTICLE VI	- ESTIMATED COST AND OBLIGATED FUNDS		

GENERAL PROVISIONS

The following provisions, numbers 1 through 39, omitting number(s) 25 and 31 are the General Provisions of this contract:

- |  |   |
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| 1. Definitions   | 20. Utilization of Small Business Concerns                            |
| 2. Changes   | 21. Utilization of Concerns in Labor Surplus Areas                    |
| 3. Biographical Data   | 22. Insurance - Liability to Third Persons                            |
| 4. Leave and Holidays  | 23. Termination for Default or for Convenience of the Government      |
| 5. Travel and Transportation Expenses                          | 24. Excusable Delays  |
| 6. Standards of Work   | 25. Stop Work Order   |
| 7. Inspection  | 26. Disputes  |
| 8. Limitation of Cost  | 27. Authorization and Consent   |
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| 10. Negotiated Overhead Rates                                  | 29. Patent Provisions and Publication of Results                      |
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| 14. Audit and Records  | 33. Convict Labor   |
| 15. Subcontractor Cost and Pricing Data                        | 34. Walsh-Healey Public Contracts Act                                 |
| 16. Reports  | 35. Officials Not to Benefit  |
| 17. Procurement of Equipment, Vehicles, Materials and Supplies | 36. Covenant Against Contingent Fees                                  |
| 18. Subcontracts   | 37. Language, Weights and Measures                                    |
| 19. Title to and Care of Property                              | 38. Notices   |

General Provisions for Cost Type Contract for Research and Development (Form CT/GP/R&D, 3-67) are attached hereto, and except for the Clauses omitted as specified above, such General Provisions are incorporated in this contract including Supplement No. 2 dated May 1963.

## ARTICLE I - STATEMENT OF WORK

A. For a period as hereinafter set forth in the Schedule, the Contractor shall perform a research and development program directed toward the study of the relation of dietary calorie intake to protein utilization in man.

### B. Scope of Work

The project is divided into three consecutive sub-studies. Part I will study the effect on Nitrogen Utilization of adding lysine to a low protein diet when ingested calories are low. Part II will study the quantitative relationship between restricted calorie intake and the utilization of dietary protein. Part III will study the effect on nitrogen utilization of giving a protein supplement at different times of the day when calorie intake is limiting.

1. Subjects: Young adult male M.I.T. students will be used as the subjects in this study. They will participate on an out-patient basis in the M.I.T. Clinical Research Center; all meals will be prepared in the Center's diet kitchens. Throughout the study each student will receive close medical supervision by the physician responsible for the specific experiment.

### 2. Protocol

(a) Part I: A protein basal diet below maintenance requirements (0.27g) wheat protein per kilogram of body weight per day, (0.27g/kg/day) will be fed to subjects who are either on an adequate or deficient intake of calories.

After stabilization of nitrogen output, L-Lysine will be added to the diet. The supplemental effect will be evaluated by comparison of the Net Protein Utilization (NPU) and the Biological Value (BV) of unsupplemented

and supplemented wheat protein. NPU and LV are measures of the absorbed or ingested nitrogen respectively that is retained and utilized in the body for maintenance. Eight to ten volunteers will be observed for a continuous period of 43 days as follows:

<u>Days of study</u>	<u>Dietary Regimen</u>
0-3	Protein free diet. 100% caloric need
4-23	Wheat Protein Supplement isocalorically
23-43	Wheat Protein plus lysine supplement isocalorically.

After a two week rest period the above regimen will be repeated using same volunteers but with a total diet of only 80 percent of estimated caloric needs.

The first 3 days on a protein free diet is designed to prepare the volunteers most expeditiously for the limited protein supplement to come. Five to ten days on the supplement are required to reach sufficient biochemical stability to permit consistent observations. For nitrogen balance studies 5 day periods are necessary in order to collect valid data on fecal nitrogen. Urinary nitrogen excretion will be measured on a strictly 24-hour basis.

(b) Part II: Two levels of protein intake 0.27 g/kg/day (below maintenance) and 0.71 g/kg/day (above maintenance) from protein sources that include hen's egg, wheat without lysine and wheat with lysine will be used in these experiments. This is the substantive part of the study and will consist of 15 dietary regimens of 8-10 students as follows:

<u>Regimen Number</u>	<u>Calorie Requirement %</u>	<u>Protein Supplement</u>	<u>Amount g/kg/day</u>
1 and 2	100	Egg	0.27 and 0.71
3 and 4	100	Wheat alone	0.27 and 0.71
5	100	Wheat with lysine	0.27
6 to 10	Replication of above with 30% calorie requirement		
11 to 13	Replication of above with 60% calorie requirement		

(c) Part III: This study is devoted to a separate question, i.e. the relative efficiency of feeding an adequate protein at the time of regular meals compared with a mid-morning snack between meals. The study is specifically aimed at determining the value of giving a glass of milk between meals (at 10:00 A.M.) to malnourished children.

The basal diet will contain dried non-fat cow's milk as the sole source of dietary protein. The available evidence in the literature indicates that adults fed adequate calories require approximately 0.4 protein/kg/day for maintenance of nitrogen equilibrium. The basal diet will supply 0.2g protein/kg/day. A protein supplement of dried skim milk powder will be given either alone at 10:00 A.M. or with meals to increase total daily protein intake to 0.4g protein/kg/day.

The exact details of the protocol are still under discussion. A final plan will be deferred to benefit from results of Part I and Part II of the project. Blood amino acids determinations will be included in the studies.

### 3. Analytical Procedures:

#### (a) Samples

(1) Complete 24-hour urine collections will be made throughout the study.

(2) Subjects will be given fecal markers at five-day intervals. Fecal samples will be collected throughout and prepared as pooled samples for each five-day experimental period.

(3) Diets will be prepared under carefully controlled conditions in a manner found successful in other metabolic studies conducted by the senior investigator.

(4) Blood samples will be taken from the antecubital vein initially and at the end of each five-day experimental period. All blood samples will be taken just prior to breakfast at 9:00 a.m., eleven hours after the last meal.

(b) Chemical Analysis

(1) Total nitrogen will be determined on daily urine and pooled fecal samples.

(2) Diets will also be analyzed at intervals for nitrogen and for energy content by the AOAC procedures.

(3) Creatinine and urea will be determined in urine samples by standard automated procedures.

(4) Blood plasma will be analyzed for total protein, albumin and free amino acids.

(5) Respiratory quotients will be determined in order to measure any change in fat metabolism.

ARTICLE II - TECHNICAL DIRECTIONS

Performance of the work hereunder shall be subject to the technical directions of the cognizant A.I.D. Scientific/Technical Office indicated on the Cover Page. As used herein, "Technical Directions" are directions to

the Contractor which fill in details, suggest possible lines of inquiry, or otherwise complete the general scope of the work. "Technical Directions" must be within the terms of this contract and shall not change or modify them in any way.

ARTICLE III - KEY PERSONNEL

The Principal Investigator for the Contract shall be Dr. Kevin Scrimshaw, Head of the Department of Nutrition and Food Science at the University, and the key personnel which the Contractor shall furnish for the performance of this contract are as follows:

	<u>Man Months</u>
Assistant Professor of Physiological Chemistry (approx. 15%)	4
Research Assistant (approx. 50%)	18
Dietician (approx. 100%)	36
Technical Assistant (approx. 100%)	36
Diet Aides (approx. 100%)	36
Statistical Clerk (approx. 50%)	18

NOTE 1: Compensation to the Principal Investigator named herein for services rendered in the performance of this contract shall not be reimbursable hereunder. If, by mutual agreement, the Principal Investigator is changed to a regular faculty member, charges for his time worked on the project will be made in accordance with the Contractor's normal accounting practices. In no event shall these charges result in an increase in the total estimated cost of this contract.

NOTE 2: The Principal Investigator may make substitutions for the above key personnel as he deems necessary for the performance of the contract.

#### ARTICLE IV - REPORTS

The Contractor shall provide A.I.D. with the following reports in addition to those required under General Provision No. 16:

A. Brief, concise quarterly progress reports covering the activities, and comments or suggestions concerning the progress, adequacy and importance of the work under way. The quarterly reports should identify the research efforts being conducted, their completion status and the direction and priorities to which attention is being directed. Twenty-five (25) copies of the report shall be submitted within ten (10) days after the end of the quarter being reported.

B. Informal interim reports should be made when data of particular significance are generated. (Twenty-five (25) copies)

C. Notwithstanding paragraph (c) of General Provision No. 16, the Contractor shall provide one hundred (100) copies of a final detailed report within three (3) months after completion of the project.

D. Two copies of each report dealing with technical matters (e.g. quarterly, semi-annual, interim and final) prepared pursuant to this Article and General Provisions Clause No. 16 to the A.I.D. Reference Center (PPC/PTIS/ARC), Agency for International Development, Washington, D. C. 20523.

#### ARTICLE V - PERIOD OF CONTRACT

The Contract shall be effective on the date of the Contracting Officer's signature. The estimated completion date is thirty-six (36) months thereafter.

#### ARTICLE VI - ESTIMATED COST AND OBLIGATED FUNDS

The total estimated cost of this contract to the Government is \$290,060.

There is presently obligated for commitment under this contract the amount of \$90,674 which may be utilized for the dollar costs set forth in Article VII, Budget. Additional U.S. dollar sums may be allocated to this contract by the Contracting Officer, in which event upon written notice to

the Contractor, the obligated funds shall be deemed increased by the additional sum or sums so allocated.

ARTICLE VII - BUDGET

The following budget sets limitations for reimbursement of dollar costs for individual line items. Without prior written approval of the Contracting Officer, the Contractor may not exceed the grand total set forth in the budget hereunder.

1st Year Budget  
June 30, 1970 - June 30, 1971

<u>Category</u>	<u>Budget Amount</u>
Salaries and Wages	\$45,520
Employee Benefits	6,464
Overhead	23,215
Travel	300
Supplies	7,150
Subject Costs	7,125
Other Direct Costs	<u>900</u>
Total	\$90,674

ARTICLE VIII - COSTS' REIMBURSABLE

The United States dollar costs allowable under this contract shall be limited to reasonable, allocable, and necessary costs determined in accordance with the Clause of the General Provisions of this Contract entitled "Allowable Cost, Fixed Fee, and Payment."

ARTICLE IX - ESTABLISHMENT OF OVERHEAD RATE

Pursuant to the provisions of the Clause of the General Provisions of this contract entitled "Negotiated Overhead Rates," a rate or rates shall be established for the period beginning July 1, 1970 and ending June 30, 1971.

Pending establishment of final overhead rates for the initial period, provisional payments on account of allowable indirect costs shall be made on the basis of the following negotiated provisional rates applied to the base(s) which are set forth below:

On Site (Home Office)	<u>51%</u> (Rate)	<u>Salaries and Wages</u> (Base)	<u>July 1, 1970 June 30, 1971</u> (Period)
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ARTICLE X - PERSONNEL COMPENSATION

A. Limitations

Compensation of personnel which is charged as a direct cost under this contract, like other costs, will be reimbursable in accordance with the Schedule, Article VIII, entitled "Costs Reimbursable", and General Provision 9, entitled "Allowable Cost, Fixed Fee, and Payment" and other applicable provisions of this contract but subject to the following additional specific understandings which set limits on items which otherwise would be reasonable, allocable and allowable.

1. Approvals

Salaries and wages may not exceed the Contractor's established policy and practice, including the Contractor's established pay scale for equivalent classifications of employees, which will be certified to by the Contractor, nor may any individual salary or wage, without approval of the Contracting Officer, exceed the employee's current salary or wage or the highest rate of annual salary or wage received during any full year of the immediately preceding three years, provided that if the work is to be performed by employees serving overseas for a period in excess of one year, the normal base salary may be increased in accordance with the Contractor's established policy and practice, but not to exceed 10 percent of base U.S. salary excluding benefits. There is a ceiling on reimbursable

salaries and wages paid to a person employed directly under the contract of the top level salary rate of FGR-1 (or the equivalent daily rate for FGR-1 if salary is not computed on an annual basis), unless advance written approval is given by the Contracting Officer.

2. Salaries During Travel

Salaries and wages paid while in travel status will not be reimbursed for a travel period greater than the time required for travel by the most direct and expeditious air route.

3. Merit or Promotion Increases

Merit or promotion increases may not exceed those provided by the Contractor's established policy and practice. Merit or promotion increases exceeding the maximum salary of FGR-1 may be granted only with the advance written approval of the Contracting Officer.

4. Work Week

The work week for the Contractor's employees shall not be less than the established practice of the Contractor.

B. Definitions

As used herein, the terms "Salaries", "Wages" and "Compensation" mean the periodic remuneration received for professional or technical services rendered exclusive of overseas differential or other allowances associated with overseas service, unless otherwise stated. The term "compensation" includes payments for personal services (including fees and honoraria). It excludes earnings from sources other than the individual's professional or technical work, overhead or other charges.

ARTICLE XI - ADDITIONAL CLAUSES AND ALTERATIONS TO GENERAL PROVISIONS

A. Clinical Studies

1. The Contractor covenants that it will conduct its activities and perform its obligations and duties under this Contract in a manner which safeguards the rights, health and welfare of the individuals who are or will be subjects of the contractor's research. In furtherance of its covenant the Contractor will adhere to the standards, regulations and requirements established by the United States Public Health Service for safeguarding the rights, health and welfare of individuals and will furnish the Contracting Officer with such further written assurances as are required by the United States Public Health Service. No funds obligated under this Contract may be expended until the Contracting Officer has received and approved in writing such further written assurances executed by the Contractor unless the Contracting Officer shall have waived in writing the submission of such further written assurances by the Contractor.

2. The Contractor agrees that it shall not conduct any clinical studies outside of the United States without the prior written approval of the Cognizant Scientific/Technical Office listed on the Cover Page of this contract.

B. For the purpose of this contract any reference to "Fixed Fee" wherever and whenever it appears shall be deleted.

C. For the purpose of this contract, any reference to "Subpart 1-15.2 (Principles and Procedures for Use in Cost Reimbursement Type Supply and Research Contracts with Commercial Organizations) of the Federal Procurement Regulations," wherever and whenever it appears shall be deleted and the following shall be substituted in its place, "Subpart 1-15.3 (Principles for Determining Applicable Costs under Research Contracts with Educational Institutions) of the Federal Procurement Regulations".

[REDACTED]

Handwritten marks at the bottom left corner, possibly initials or a signature.

D. Revise General Provisions Clause 5(a) (2) by deleting the amount "\$30.00" and in lieu thereof inserting the amount "\$40.00".

E. Delete General Provisions Clause No. 12 and substitute in lieu thereof the following:

"12. Examination of Records

(a) The Contractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until expiration of 3 years after final payment under this contract, or of the time periods for the particular records specified in Part 1-20 of the Federal Procurement Regulations (41 CFR Part 1-20), whichever expires earlier, have access to and the right to examine any directly pertinent books, documents, papers, and records of the Contractor involving transactions related to this contract.

(b) The Contractor further agrees to include in all his subcontracts hereunder a provision to the effect that the subcontractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until expiration of 3 years after final payment under the subcontract, or of the time periods for the particular records specified in Part 1-20 of the Federal Procurement Regulations (41 CFR Part 1-20), whichever expires earlier, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor, involving transactions related to the subcontract. The term "subcontract" as used in this clause excludes (1) purchase orders not exceeding \$2,500 and (2) subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public."