PD-AAA-327-D1

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A.I.D. PROGRAM

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SUBJECT – Non-Capital Project Paper (PROP)
Protein Foods and Food Fortification

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COUNTRY: Brazil
PROJECT Nº: 512-15-233-288
SUBMISSION DATE: September 15, 1971
ORIGINAL: No; Revision nº ONE
PROJECT TITLE: Protein Foods and Food Fortification
U.S. OBLIGATION SPAN: FY 71 through FY 75
PHYSICAL IMPLEMENTATION SPAN: FY 72 through FY 76
GROSS LIFE-OF-PROJECT FINANCIAL REQUIREMENTS:

U.S. dollars	FY 71	145,000
AID/W Input		380,100
		(amount to be determined)
Local currency: (expressed in U.S. dollars)		
A. Trust Funds		102,800
B. PL 480 and CONTAP/SUBIN		75,000
Cooperating country contribution (in U.S.$)		2,127,000
TOTAL		2,889,900

(Exchange rate: US$1.00 = Cr$5,37)

Enclosures: Part Chart
Table I through IV

PAGE 1 OF PAGES 19

DRAFTED BY	OFFICE	PHONE NO.	DATE	APPROVED BY:
MFrazão:mamf	RHFD/R	382	9/3/71	Robert Ballantyne, D/AID

AID AND OTHER CLEARANCES
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CLASSIFICATION

AID-5-39 (11-68)

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PROTEIN FOODS AND FOOD FORTIFICATION

PROP 512-15-233-288

INTRODUCTION

This PROP revision is submitted to comply with the stipulations of AID/W in AIDTO A-427 of 10/5/70, to incorporate the changes experience has shown to be necessary and to extend the final obligation date to 1975. Work done in the field of nutrition is of necessity long-term, and a longer time frame is essential before results can be achieved or properly evaluated.

Summary:

USAID assistance to combatting malnutrition in Brazil began/in 1962 with the initiation of a Food for Peace program. However, over a period of 4 or 5 years, it gradually became evident that Brazil had both the technological know-how and the industrial capacity to undertake production of protein foods for its own institutional use and welfare programs. What was lacking was a recognition of the importance of the malnutrition problem as a factor of development, and the planning of integrated ways of attacking it, by both the public and private sectors. In 1967 USAID began working with the Brazilian food industry and efforts were undertaken to determine where USAID assistance might be most effective. Through an agreement with the Planning Unit of the Ministry of Health, funds were provided to the National Food Commission for an array of nutrition projects, mainly in the field of nutrition education. In 1969 discussions were reinitiated with both the National Food Commission and private industry with a view towards better defining feasible projects in the area of production of protein foods and fortification of basic commodities. A meeting between Government and Industry was held, under joint GOB, industry and USAID sponsorship, in May of 1970, and more precise determination reached of recommended areas for USAID technical input. PROP 512-15-233-288 was the outgrowth of this process.

Current Status of Sub-Projects:

A. Fish Protein Concentrate (FPC) Production: The Brazilian National Development Bank (BNDE) recently provided approximately US$80,000 for the purchase of machinery to transform the laboratory-scale process developed by the Marine Research Institute into a pilot plant to produce sufficient amounts of FPC for biological testing and product development. USAID provided technical assistance at various points in the development of the process as well as in designing

the production line to be set up. A contract for the purchase of the machinery in the U.S. and Canada has now been signed by the Marine Research Institute and USAID will continue to provide technical assistance to help set up the pilot plant in Brazil and test its proper functioning; to assist the Marine Research Institute in critical experiments for improvement of the process itself; and, when sufficient production of a good quality product has been reached, assist in the development of food products which can utilize this high-protein fortificant. USAID is also providing participant training in the U.S., Canada and Chile for the 2 Marine Research Institute technicians mainly responsible for the project, to accompany the modular testing of the machinery before shipment and observe FPC processes in other production plants in the U.S. and Chile. A small commodity input by USAID will provide equipment not available in Brazil for a quality control laboratory and a laboratory for research on the fish oil extracted.

B. Fortification of mandioca flour: Mandioca (cassava) flour is a staple of the Brazilian diet, used throughout the country, especially in the more depressed areas, such as North and NE, as well as in urban slums and workers' zones. Although a major source of calories, it contains only around 1% protein. Efforts undertaken towards fortifying mandioca flour have made excellent progress. Biological testing of various fortificants is under way at the Medical School at Ribeirão Prêto and the Institute of Nutrition in Recife (as well as at the British-American Hospital in Lima, Peru, under AID/W sponsorship). Preliminary taste testing has been carried out with collaboration of International Flavours and Fragrances. A simple cost/benefit study of various fortificants, at different levels, has also been made. Contacts with industrialists have led to assurances on the part of 2 major distributors in the Rio area to launch a fortified product on the market as soon as the technological problem of dry-process addition of fortificant vs. use of a pre-mix is determined, and this is currently under study. Appropriate field tests on acceptability must still be mounted. A close working relationship with an ARDO contract group in Recife may provide some information on the NE, but a more profound economic study must be undertaken before results can be determined sufficiently to permit expansion of the project to other areas outside greater Rio. AID/W is backstopping this project technically, as it has possibilities for application in other developing countries, and has also provided funds towards an international meeting on this subject to be held in Rio early next year.

C. Production of powdered soy milk (SOLEIN): The Mococa Dairy Co. in the interior of São Paulo has worked for over 10 years to develop a soy milk product; this has been amply tested by the Brazilian National Department of the Child in its pediatrics hospital

as well as in laboratories in the U.S. and shown to be excellent. Production has been severely hampered by the fact that the company could not afford the purchase of an additional spray-drier for the exclusive production of this product, but utilized its regular powdered-milk driers during their idle time; this meant a stop-and-go production, and in times of milk "surplus", no production at all, resulting in a high-priced product. USAID input of a used spray-drier will permit more continuous production which, together with a formula modification suggested by a USAID consultant, will permit production for institutional use, at considerably lower cost. The company has signed an agreement with the National Food Commission to supply this soy milk powder to any valid welfare institution at cost, plus a very small profit margin, during the 3 years following the installation of the drier, "in return" for the USAID-provided spray-drier. USAID is also providing technical assistance during the installation and start-up of the machinery.

D. Fortification of PL 480 wheat flour with lysine for the National School Lunch Program (CNAE): Since lysine has been shown to be one of the major deficiencies of the average Brazilian diet, a project was worked out with CNAE for adding lysine to the wheat flour used in making macaroni for school feeding at 12 sites throughout Brazil. The lysine to be used is on order, and purchase of the blending machinery will shortly be processed. CNAE will evaluate this project periodically.

I. PROGRAM OR SECTORIAL GOAL

A. Statement of Goal:

To assist GOB to attack its key nutrition problems:

1. Limited availability of low-cost nutritious foods
2. Motivating consumers to eat more protein
3. Incorporating nutrition planning into the power structure

Note: A 4th key problem area, how to reach the pre-school child, is recognized as extremely important, since this age group is the most vulnerable and important as far as future development is concerned. However, due to inadequacy of the present delivery system at national level to reach this segment of the population, HNFD is working specifically to improve capabilities in this area at state level, and this food fortification project will attempt only to reach the pre-school child by means of general improvement of the family diet.

B. Measures of Goal Achievement:

1. More protein foods or fortified commodities available on market at reasonable costs.

2. Better feeding practices would be evident, as demonstrated by sales of protein and/or fortified foods to both commercial and institutional markets.

3. Institutions addressing practical nutrition problems would be strengthened and expended.

4. A national nutrition policy framework would be visible and effective.

C. Important Assumptions:

(That USAID continues its efforts in this field over a five year period).

1. That the political scene in Brazil remains stable

2. That GOB recognizes it has a continuing and possibly worsening malnutrition problem, and determines it will attack it; that GOB also recognizes that malnutrition is a significant factor inhibiting development, concerning which national policies can and must be based to achieve progress.

3. That coordination will be achieved among nutrition units of the various ministries so they may all contribute harmoniously to the promotion of better nutrition practices in Brazil.

4. That the National Food Commission will continue its close working relationship with USAID.

II. PROJECT PURPOSE

A. Statement of Purpose:

1. To continue to increase protein availability by a) production of FPC, b) fortification of mandioca flour; and c) making more protein available to rural families not now being reached by processed or fortified foods (Opaque-2 corn - liaison for AID/W project).

2. To promote increased consumption of protein by a) assisting in a training course in designing and marketing of low-cost protein foods, b) establishment of optimum mixes of locally available commodities and c) use of mass media for consumer education (liaison for AID/W project).

3. To continue efforts to motivate the power structure to consider nutrition programs as part of overall development and to formulate policies on food and nutrition consistent with its expanding planning efforts.

4. To assist public and private institutions of research, development and implementation to strengthen and focus their efforts on nutritional consideration.

5. To ascertain comparative value of fortification possibilities and/or other approaches to combatting malnutrition.

B. Strategy:

1. To increase protein availability, USAID will continue its efforts towards FPC production and fortification of mandioca flour; it will terminate its assistance in production of soy milk and fortification of PL 480 wheat flour when planned inputs have already been made; and will serve as liaison for an AID/W-sponsored project to increase utilization of high-lysine (Opaque-2) corn by subsistence-level farmers, as follows:

A pilot project is being set up in collaboration with the Rural University at Viçosa, Minas Gerais. Hybrid Opaque-2 (high lysine) seed will be provided by the Agroceres Seed Company and distributed by the Rural Extension Service (ACAR) to 50 selected farmers. Both entities will provide technical assistance to the farmers. The Department of Nutrition and Health of the School of Domestic Sciences of the University will provide nutrition education and teach the housewives how to use the Opaque-2 cornmeal after it is harvested and ground. They will also evaluate its acceptability by the 50 families, as well as in school feeding programs in Viçosa. The ARDO/Purdue contract team at Viçosa will provide technical assistance to the project as required, as will other schools of the University. The project will be coordinated by the Department of Nutrition. (AID/W will make an input, considering this a project of world-wide implications, but this input has not been defined as yet).

2. To promote increased consumption of protein, USAID will participate in 2 new activities and serve as liaison for an AID/W project in this field:

a. Training course in designing and marketing of protein foods.

This will be aimed at overcoming the bottleneck of improper or ineffectual designing of protein foods for the consumer market, a problem encountered in previous attempts by Brazilian industry to commercialize protein foods (e.g. Fortifex, Cerealina, Incaparina, etc.). The 2-week course will be sponsored and organized by ABIA (Brazilian Association of Food Industries) in collaboration with the Food Technology Institute at Campinas, which gives a course in marketing and will provide Brazilian teachers to work with the U.S. consultants. Registration fees to be paid by participating companies for their staff members will cover actual secretarial and administrative costs; USAID input will be merely technical assistance, bringing down 2 specialists (such as Dr. Ray Goldberg of Harvard School of Business) to give the course, in collaboration with qualified Brazilians. (This activity will be under the direct supervision of the Protein Foods Sector of ABIA, established as an outcome of the Government/Industry meeting previously sponsored by USAID).

b. Establishment of optimum mixtures of locally available commodities.

Through agreement(s) with one or more nutritional research centers, work will be undertaken to determine best amino-acid balances from a variety of combinations of Brazilian staples, e.g. if it would be considerably more nutritive to eat beans and corn together rather than beans and rice etc. AID/W will backstop with some research materials and USAID input will also be mainly research materials. The findings coming out of this research will be used in the consumer education work of ABIA Protein Foods Sector (mentioned above) and in the consumer education program mentioned below.

c. Use of mass media (mainly radio and TV) for consumer education.

This would be an AID/W-sponsored project similar to one recently carried out in India, to check findings in that country. USAID would provide liaison services with the Brazilian entity chosen to administer it.

3. To encourage GOB entities to develop policies regarding food and nutrition, USAID/B project coordinator dedicates approximately 15% of time to this non-specific work. Partly as a result of such stimulation, the following are examples of the type of progress which has been achieved:

   a. At least two ministries, Finance and Planning, have become more interested in nutrition as a factor in the development process, to the point of creating specialized units within their own areas. USAID/B is fomenting these efforts by inviting key Brazilian personnel from those ministries to attend international meetings and conferences where the vital role of nutrition in planning for development is discussed, e.g. III Western Hemisphere Conference on Malnutrition in Miami August 26 - September 6th; and the meeting on Nutrition and National Development and Planning at M.I.T. in mid-October.

   b. Various states are working intensively on statewide integrated Nutrition programs and one State Governor has already promulgated such plan. Key people from the state planning level are also invited to appropriate meetings.

   c. A section on nutrition will, for the first time, be included in the GOB National Plan for Development, to be published at the end of this month.

4. To assist public and private institutions to strengthen and focus their efforts on nutritional considerations, the following represent the type of efforts being made:

   a. The National Food Commission has signed sub-agreements with the Marine Research Institute and the Mococa Dairy Company, and is processing agreements with the Institute of Food Technology in Rio and the National School Lunch Program, thus strengthening its coordinating functions;

   b. Discussions are being carried on with the INPS (Social Welfare Institute) which provides health services and welfare assistance to 30 million Brazilians (1/3 of the entire population) regarding participation in the mandioca fortification project by supplying fortified mandioca to its beneficiaries.

5. To ascertain comparative values of forbification possibilities and/or other approaches to combatting malnutrition, a contract

is planned with a qualified U.S. consulting firm to carry out a computerized study on this in Brazil, with the collaboration of local technicians.

C. Conditions expected at end of project:

1. A good quality FPC would be in production and food products would have been developed utilizing this fortificant.

2. A fortified manidoca flour would be on the market and subsidized by GOB or purchased by welfare entities for use in family and emergency feeding.

3. Utilization of opaque-2 corn by subsistence farmers would be widespread.

4. Industry will be better prepared for designing and marketing low-cost protein foods.

5. Optimum mixes of locally available commodities will have been determined and consumers will have learned to use them, through mass-media and other nutrition education programs.

6. Policies will have been formulated at GOB and/or State level relating to nutritional aspects of agricultural, health, industry, export and development policies, and line items for nutrition will be included in budgets and plans.

D. Basic Assumptions:

1. Legislation will be enacted, or be in process, to establish minimum protein levels of basic commodities.

2. Incentives will be granted by GOB, either direct or indirect, for the production and sale of protein foods.

III. PROJECT OUTPUTS

1. Functional laboratory research and pilot plant facilities for FPC production.

2. Trained technicians to handle FPC production in various areas of Brazil.

3. Development and utilization of foods incorporating FPC.

4. Commercial marketing and utilization in public and private mass-feeding programs of fortified manioca with eventual subsidization by GOB for latter.

5. Research and marketing staffs of industry will be trained in designing and marketing protein foods.

6. Optimum mixes of local commodities will be known to the consumers.

7. Comparative cost/benefit study on approaches to combatting malnutrition will be made.

A. Magnitude of Outputs:

1. Pilot plant will produce 15 kilos of FPC/day for food fortification by end of FY 72.

2. 6 technicians for FPC production from various states of Brazil will have been trained in U.S. and training will commence within Brazil by early FY 74.

3. An array of food products fortified with FPC will be available for commercial markets and for public and private mass feeding programs by FY 75.

4. The pilot-scale plant will have progressed to industrial-sized production and/or the perfected process turned over to industry.

5. Commercial distribution of fortified manioca by at least 2 industrial firms in Rio area by FY 73; by most of the large industrial firms and utilization by at least 25% of mass feeding institutions (such as INPS, SESI, etc.) by FY 75.

6. At least 60 research and marketing businessmen trained in São Paulo area by FY 74.

7. The results of the systems analysis of the best ways to combat malnutrition in Brazil will be known by the end of FY 74, for use by GOB (and USAID).

B. Assumptions:

1. Returning Brazilian technicians will train others in their respective areas.

2. Critical experiments at the pilot plant will show the Brazilian FPC process to be successful.

3. Construction of industrial plant for FPC and/or licensing of process to outside producers will be undertaken by the Marine Research Institute.

4. A fortified manditoca product will be successfully developed, and have the desired acceptability.

5. There will be widespread utilization of Opaque-2 corn by at least 100 farmers in Viçosa area and spreading to other areas.

6. Nutrition concepts will be made available to consumers through mass nutrition education programs.

IV. INPUTS

1. USAID:

A. Technical Assistance: 1 full time coordinator
18 short-term consultants (appr. 11 m/m)

B. Participant Training: 12 to be trained in the United States
60 to be trained in Brazil

C. Commodities: Research Materials - $30,000 FY 73; $20,000 FY 74

D. Other: Systems analysis computer time $25,000 FY 73; $40,000 FY 74
Subsidizing manditoca fortification
for demonstration to COB (1 yr.) $20,000 FY 73

2. Host Country Inputs:

FPC production:

US$80,000 from ENDE for pilot plant machinery (in hand)
Staff time
New building at Marine Research Institute (and related utilities) for pilot plant and laboratories.
Additional personnel (including 2 chemists) to work on FPC project (for 2 years)
Laboratory equipment for new laboratories
Fish oils project and fluor research

Mandioca fortification: Laboratory research
Product development
Taste testing
Economic study
Commercial marketing efforts
Administrative support
Local costs international meeting

AEIA: Marketing Seminar input
Protein foods education

Mococa: Building and facilities
Staff
Raw materials

CNAE: Personnel
Manufacturing costs and distribution
Travel

RATIONALE

Malnutrition in general may be compared figuratively to an iceberg, with a relatively small proportion of the whole visible and impressive and the far larger portion - in Brazil affecting an estimated 60% of the population - insidiously undermining the health and well-being of the people, but without necessarily revealing its existence. Although the problem itself is vaguely recognized, little consideration has been given by government planners to the role of malnutrition in limiting development, nor have the economists taken into consideration its impact on lowered productivity, ineffectual returns on the investments in education, or its over-all cost to the nation at large.

Statistics in Brazil are frequently unreliable and food consumption surveys often incomplete, yet all point to the fact that protein shortage is severe, due mainly to inadequate purchasing power for acquisition of traditional proteins - meat, fish, milk, eggs, poultry - which are costly, and also to insufficient knowledge by the majority of the consumers of the need for protein in the daily diet. The problem, then, appears to be twofold: to increase the availability of low-cost protein foods and to increase consumption of protein foods when available. AID as well as other international organizations interested in combatting malnutrition, such as FAO, UNICEF, etc., have over the past decade or more attempted various strategies in the "war on hunger". Experience has shown that stepping up production of traditional proteins is not enough, as it cannot keep pace with the exploding populations in most of

the developing nations and the cost is too high. Previous efforts, such as replacing traditional sources of protein by use of high-protein cereal mixes (Incaparina, Fortifer, Pro-Nutro) have had very limited success as one cannot superimpose unfamiliar mixtures, no matter how nourishing, on people's customary dietary patterns without large-scale efforts and expenditures in their promotion (even then not always successful). Consequently, it appears that efforts should be concentrated on:

1. Making available a wider range of low-cost protein foods similar to those customarily consumed and/or increasing the protein availability in widely used basic commodities and processed foods through fortification, and

2. utilizing the most effective method for educating the consumers, especially mothers of young children, to provide more protein in the family's daily diets.

After long-range study of the problems and considerable discussions with public and private entities, the undertakings herein described have evolved as those of wide impact most likely to succeed.

An economic study based on a systems approach should be undertaken in FY 73 to evaluate comparative effectiveness of various fortification possibilities and/or other approaches and indicate which are most likely to succeed. It is believed that there is technical competence available in Brazil to carry out such a study. USAID's input would be technical assistance as well as financial support for the computer time involved.

ROUNTREE

PERT PLAN

FPC		Responsible	Approx. Dates
STEP 1	Purchase of machinery in U.S. and Canada	IDMON	8 - 12/71
2	List of required local commodities to Admiral	IDMON	9/71
3	Assembly of U.S./Canadian machinery	IDMON	12/71-1/72
4	Assembly of Brazilian-acquired machinery	IPqM	12/71
5	Modular testing prior to shipment	IDMON	1/72
6	Assembly all material at site	IPqM	2/72
7	Observation and training 2 participants in U.S. Canada and Chile	USAID	11/71-2/72
8	SNC consultant to supervise installation of plant	USAID/IDMON	2/72
9	John Blake to set up process	USAID/IDMON	3/72
10	IDMON consultant - for critical experiments	USAID/IDMON	4/72
11	Food technologist for incorporating FPC into other foods	USAID/IDMON	6/72
12	Research on fluor level and biological value FPC	IPqM (Univ. São Paulo)	4-6/72
13	Evaluate results critical experiments	IDMON/IPqM	7-8/72 12/72
14	Seek financing industrial plant or license process	IPqM	73
15	Promote utilization FPC as fortificant commercially	IPqM	71-73
16	Promote legislation to make minimum protein levels compulsory in basic commodities	IPqM	71-73
17	Research on oil utilization	IPqM	71-73

		Responsibility	Approx. Dates
Manioca fortification			
STEP 1	Continue biological testing fortificants	CNA sub-contracts	9/71- 12/71
2	Product development	CNA sub-contract	9/71 - 12/71
3	Economic study	CNNA sub-contract	11 - 12/71
4	Genetic improvement (simultaneous)	ITA (IPEACS)	(constant)
5	Marketing assistance	USAID	4 - 6/72
6	International meeting	USAID /CNA	3/72
7	Commercial market testing	(industry)	1/72 ---
8	Pilot subsidized testing	CNA/USAID	7/72 - 9/72
9	Evaluation economic study	CNA/ USAID/ AID/W	3/72
10	Decision on how to proceed	CNA/USAID/ AID/W	3/72
11	Efforts to make minimum protein levels compulsory	CNA	72 - 74
12	World-wide application	AID/W	73
Marketing Protein Foods - Seminar			
1	Make arrangements with U.S. entity	USAID	9 - 12/71
2	ABIA coordinate with Institute Food Technology in organizing training seminar	ABIA	1 - 5/72
3	Giving seminar	USAID/ABIA	7/72
4	Repeating for 2nd year	USAID/ABIA	7/73
5	Up-dating techniques	USAID/ABIA	7/74
Optimum Mixes			
1	Finding and contracting entity to do research	CNA/GOB	9 - 12/71
2	Carrying out research	(Entity)	1/72 - 4/72
3	Applying results of research in consumer education programs	All Brazilian entities	5/72 -----
Systems Analysis of Best Approaches to Combatting Malnutrition			
1	Contracting firm to make analysis	USAID/ AID/W	FY 73
2	Making information available to GOB	USAID	FY 73-74

TABLE I

NON-CAPITAL PROJECT FUNDING (Obligation in US$000)

COUNTRY: Brazil

PROJECT TITLE: Protein Foods and Food Fortification

PROJECT Nº 512-15-233-288

Fiscal Years	Ap	L/G	Total	CONT 1/	PRNS. SERV. AID	PRNS. SERV. CONT	Partic. U.S. Agen.	Commod. U.S. Agen.
Operational FY 1972	Ag	G	38.7	3.3	23.0	3.3	12.4	-
Budget FY 1973	Ag	G	162.2	38.4	24.0	38.4	24.8	75.0
B + 1 FY 1974	Ag	G	131.9	23.1	24.0	23.1	24.8	60.0
B + 2 FY 1975	Ag	G	47.3	9.9	25.0	9.9	12.4	-
All Subs. yrs.	-	-	-	-	-	-	-	-
Total life	Ag	G	380.1	-	96.0	75.7	74.4	135.0

1/ Non Add Column

TABLE II

NON CAPITAL PROJECT FUNDING

(Exchange Rate U.S.$1.00 = Cr$5,57 Project Nº 512-15-253-288)

Fiscal Years	Local Currency (shown in US$)		Other Contributions Cooperating Country (in US$000) (Table IV)
	Trust Funds (in U.S.$000) (Table III)	PL 480 or CONTAP/SUBIN (in U.S.$000) (Table IV)	
Operational FY 1972	19.5		652
Budget FY 1973	51.3		477
B + 1 FY 1974	32.0	50	514
B + 2 FY 1975	20.0	25	484
All Subs. yrs.	-	-	-
Total Life	102.8	75	2,127

TABLE III: BUDGET (in US$000's)

	FY 72		FY 73		FY 74		FY 75	
Technical Assistance	Permanent Coordinator	18 (5)	Permanent Coordinator	19 (5)	Permanent Coordinator	19 (5)	Permanent Coordinator	20 (5)
	Mrkt/economist (mandioca) (1 m/m)	2.1 (1.2)	Oils tech. (1 m/m)	2.1 (1.2)	FPC (2) for RGN & RGS (1 m/m)	2.1 (2.4)	2 Mrkg trg (up-date) (1 m/m)	7.5 (2.4)
			FPC eng (2) (1 m/m)	2.1 (2.4)	Mrkt trg (2)(1 m/m)	7.5 (2.4)		
			Mrkt trg (2) (1 m/m)	7.5 (2.4)	1 systems analyst (1 m/m)	7.5 (1.2)		
			2 systems analysts (2 m/m)	15 (2.4)				
			Food standards expert (1 m/m)	2.1 (1.2)				
		26.3		62.4		47.1		34.9
Part. Trg.	2 Nutrition Studies	10 (2.4)	2 FPC (RGN & RGS)	10 (2.4)	2 FPC (SP & other)	10 (2.4)	2 Nutrition	10 (2.4)
			2 Nutrition	10 (2.4)	2 Nutrition	10 (2.4)		
		12.4		24.8		24.8		12.4
Commodities			Research materials	30	Research materials	20		
Other			Systems Analysis computer time	25	Systems analysis computer time	40		
			Subsidising mandioca fort. (1 year)	20				
TOTALS		38.7		162.2		131.9		47.3

(*) Numbers in parenthesis are estimated travel expenses.

TABLE IV

Basis for Calculating Brazilian Cash Inputs (in U.S.$000's)

	FY 72	FY 73	FY 74	FY 75
FPC				
New Equipment BNDE	80	-	-	-
Building	20	(lab)10	10	5
Utilities (electricity, power, steam, gas, water	20	20	20	20
Raw materials	20	20	20	20
SUDEPE personnel	60	30	-	-
SUDEPE equipment	150	5	-	-
Staff time	30	30	30	10
Mococa				
New Building	10	-	-	-
Supplementary equipment	5	-	-	-
Staff time	5	3	1	1
Utilities	5	5	5	5
Raw materials	60	80	100	100
CNAE				
Travel	5	5	3	3
Tech. assistance & evaluation	5	3	-	-
Lysine (PL 480)	-	-	-	(25)
Mandioca				
Lab. research	15	5	-	-
Product development	5	-	-	-
Field tests	-	10	5	-
Meetings	2	1	-	-
Subsidising SUBIN	-	-	50	-
ABIA				
Nutrition education	20	10	20	20
Training seminar	10	10	-	-
Optimum mixes				
Research	15	-	-	-
Opaque-2 corn				
Staff time	5	5	-	-
Surveys	5	5	-	-
General Foods				
Raw material	100	200	300	300
TOTAL	652	477	564	509