

I. PROJECT IDENTIFICATION

1. PROJECT TITLE

HEMOPROTOZOAL CONTROL

PD-AAC-512-B1

2. PROJECT NO. (PASA, CONTR.)
 931-11-130-057
 3. SUBMISSION
 ORIGINAL
 REV. NO. _____ DATE _____
 CONTR./PASA NO. _____

3. RECIPIENT (specify)

COUNTRY Worldwide
 REGIONAL _____ INTERREGIONAL _____

4. LIFE OF PROJECT

BEGINS FY 1975
 ENDS FY 1977

II. FUNDING (SOFS) AND MAX MONTHS (MM) REQUIREMENTS

A. FUNDING BY FISCAL YEAR	B. TOTAL \$	C. PERSONNEL		D. PARTICIPANTS		E. COMMODITIES \$	F. OTHER COSTS \$	G. PASA/CONTR.		H. LOCAL EXCHANGE CURRENCY RATE: \$ US <u>16p.</u> U.S. OWNED		
		(1) \$	(2) MM	(1) \$	(2) MM			(1) \$	(2) MM	(1) U.S. GRANT LOAN	(2) COUNTRIES	
1. PRIOR THRU ACTUAL FY												
2. OPRN FY <u>75</u>	75	38	56	2.0	4	12	23					
3. BUDGET FY <u>76</u>	75	40	66	3.0	4	11	21					
4. BUDGET +1 FY <u>77</u>	75	42	66	3.0	4	8	22					
5. BUDGET +2 FY												
6. BUDGET +3 FY												
7. ALL SUBQ. FY												
8. GRAND TOTAL	225	120	198	8.0	12	31	66					

9. OTHER DONOR CONTRIBUTIONS

(A) NAME OF DONOR	(B) KIND OF GOOD/SERVICE	(C) AMOUNT

III. ORIGINATING OFFICE CLEARANCE

1. DRAFTER <u>C. E. Stuart</u> <i>CES</i>	TITLE <u>Livestock Specialist TA/AGR</u>	DATE <u>11/27/74</u>
2. CLEARANCE OFFICER <u>L. F. Hesser</u> <i>LFH</i>	TITLE <u>Acting Director TA/AGR</u>	DATE <u>11/27/74</u>

IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL

2. CLEARANCES

BUR/OFF.	SIGNATURE	DATE	BUR/OFF	SIGNATURE	DATE
			TA/PM	J. Gunning <i>JG</i>	1-10-75
			TA/PM	C. Fritz <i>CF</i>	11/27/74
			TA/AGR	M. Galli <i>MG</i>	11/27/74
			TA/AGR	N. Konnerup <i>NK</i>	11/27/74
			TA/AGR	R. Holmes <i>RH</i>	11/31/74

3. APPROVAL AND OFFICER, DIRECTORS

SIGNATURE Curtis Farrer *CF* DATE 1/10/75
 TITLE AA/TA Acting Ass't Administrator

4. APPROVAL AND OFFICER, ASSISTANT DIRECTOR

SIGNATURE _____ DATE _____
 TITLE _____

January 9, 1975

MEMORANDUM TO: AA/TA, Mr. Curtis Farrar

FROM: TA/PM, Carl R. Fritz 

SUBJECT: PROP - Control of Hemoprotozoal Disease

The hemoprotozoal project proposal was reviewed at the joint GTSC/RIGC meeting held on October 15, 1974. Committee members attending that meeting unanimously supported its concept, which is, essentially, the field testing of Texas A&M research into the control of hemoprotozoal diseases.

On November 29 the PROP was routed for R&DC review and optional comment. Following its study of the PROP LA Bureau raised a number of reservations which were answered by TA/AGR (see attached memos dated Dec. 10 and 19, 1974). LA Bureau subsequently entered a "no objection" position, so the project is now ready for final approval.

Please indicate your approval by signing the PROP facesheet.

Attachment: a/s

UNITED STATES GOVERNMENT

Memorandum

*J. H. ...
LA has no
objections JFM, 12/26/74*

TO : LA/DR, Charles J. Stockman

DATE: December 19, 1974

FROM : TA/AGR, Leon F. Hesser *LPH*

SUBJECT: TA/AGR PROP - Control of Hemoprotozoal Disease

In response to the issues raised in your memorandum of December 10 addressed to Mr. Carl R. Fritz, TA/PM, TA/AGR has prepared the attached Addendum for clarification. TA/AGR hopes this will meet LA/DR reservations concerning the implementation of this PROP in Colombia and Ecuador.

Reservation 1.

1. What will be the benefits to the livestock industry and the LDCs?

Response:

Quantitative results in terms of increased weight in small groups of cattle protected by vaccination and premunition against these diseases indicate a twofold gain over unprotected controls. Product value is also approximately double. Since these experiments have only been replicated on a small scale, it is the purpose of this utilization project to expand this data by measuring results on a full scale field trial in areas of marginal tick exposure when these animals are moved into heavy exposure areas. It is hoped that this investigation will demonstrate up to 50 percent increase in productivity.

It has been estimated that losses among susceptible cattle introduced into disease/vector areas of the lowland tropics ranges from 35 to 70 percent. Virtually all of the livestock in these areas are relatively low quality and any upgrading of these animals requires introduction of superior animals. The source of supply of such animals is in temperate zones and all of these animals are susceptible to these diseases.

Recently a plan was proposed to introduce up to 100,000 North American breeding animals into Ecuador. Losses in movement of such animals into the tropics in the past have resulted in death losses ranging from 40 to 70 percent and a decline in productivity to a point that production of these high quality animals barely exceeds that of indigenous stock.

Reservation 2.

If there is going to be a measurable increase in livestock production efficiency what is an estimated expected increase?



Response 2.

In addition to an anticipated doubling of productivity resulting from the application of these techniques, it is also anticipated that protected animals will reach full maturity at three years of age instead of five to seven years.

A quantitative example of the significance of a twofold increase in production in a herd of 100 animals protected over a herd of 100 unprotected animals is extrapolated from research data on several small groups of cattle.

Weight 100 animals prior to treatment	- 40,000 pounds
Weight 100 animals treated 10 mos. later	- 74,000 pounds
Weight 100 animals unprotected 10 mos. later	- 54,000 pounds

Assuming treatment costs per animal of \$0.20 and value of treated animals is \$150, the total benefits per 100 animals would be approximately \$7,500.

CIAT is providing services of an agricultural economist who will refine and publish data accumulated during the project operation.

Reservation 3.

Will the activities described in the PROP be demonstrations or programs?

Response 3.

The activities are considered demonstrations and it is expected that demonstrations of protection of statistically significant numbers of animals in Colombia, Brazil, Mexico, Ecuador and Africa under normal farming-ranching conditions will produce a visible benefit. Since the cost of immunization or premunition is very low, it is assumed that cattle raisers with Ministries of Agriculture support will carry out programs on an extensive basis.

The initial projects are in Colombia for intensive demonstration in the transition zone between the heavily tick infested lowland and the Piedmont where ticks occur intermittently. It will also be demonstrated on the ICA/CIAT livestock stations in the Llanos, the lowlands (North Coast) and in the Cauca Valley.

Demonstrations of anaplasma control will be conducted by the Government of Mexico in their project to move more than 50,000 animals from the highlands to the southern coastal plain. Texas A&M University personnel are in contact with Mexican Veterinarians on a major anaplasmosis control program in Mexico.

The initial demonstration in the countries are expected to develop into officially supported programs by the Ministries of Agriculture. In fact the activity in Mexico can now be considered a program. It is expected that the material benefit will be highly visible and it is our experience that livestock raisers do recognize benefits and do implement practices leading to increased production when they are demonstrated. Premunition of cattle for hemoprotozoal disease will be easily adapted to present vaccination programs required by the governments, from measures taken to control a disease e.g., vaccination for Aftosa is a practice recognized and accepted by government officials and livestock growers.

Texas A&M will demonstrate protection against anaplasma and babesia in breeding animals being shipped from North America to tick infested areas of Ecuador. Personnel associated with the Colombia program will follow up evaluation in Ecuador.

Brazil plans an extensive program in the State of Sao Paulo and has requested advisory assistance through CIAT.

The demonstrations in Africa will follow the scheduled Workshops.

This project in Colombia has the full support of CIAT and the Veterinary services of ICA. A large number of Colombian Veterinarians from three Universities in Colombia have completed advanced training and are now organizing field teams of technicians to carry out operation of the demonstration program.

Commercial livestock interests in the U.S. have requested Texas A&M assistance in protecting up to 100,000 head of export breeding stock to Ecuador. However, it should be noted that protection of animals against these diseases may have the most beneficial impact on small livestock raisers and that at least half of the 10-20 ranches mentioned in the PROP will fall in this category.

Texas A&M personnel assigned to the project in Colombia will be assisted by Colombian counterparts and will be available to other countries on an advisory basis, as will CIAT Veterinarians.

Reservation 4.

What is the input for bringing about an adequate supply of biological agents and chemotherapeutic materials?

Response 4.

Most of the countries in which programs are anticipated have commercial or government support facilities for production of biologicals of these characteristics. The cost of materials for such biologicals is very low

and a product for protection against anaplasmosis is already being marketed. These programs should demonstrate a superior anaplasma product and an effective system for protection against babesiasis.

Production of stable inoculums on a massive scale at very low cost is possible. These can either be stockpiled (deep frozen) or be produced on a regularly scheduled commercial basis.

All of the commercial or government supported biological production laboratories in Latin America are looking for new products. The demonstrations conducted by Texas A&M and CIAT will leave in each country the protocols for production of vaccines or premunition materials. The biological agents are readily available and may be stockpiled for regeneration of supplies as needed.

Reservation 5.

How will personnel be trained?

How many involved?

How many cooperating ranches or government installations?

Response 5.

CIAT has indicated that it plans dissemination of project results to member countries. CIAT and Texas A&M have scheduled a Workshop in Colombia March 17-21, 1975, to demonstrate immunizing and premunition techniques. There is a planned attendance from at least six Latin American countries, Africa, Australia and the U.K. FAO will also participate. A follow up Workshop with ILRAD/ICRPE is planned for FY 1976 in Kenya.

A relatively large number of Colombian scientific and technical personnel and a few from other countries have been trained on the ground. At least six Colombians have undergone graduate training abroad or in Colombian Universities.

The demonstration calls for 10-20 cooperator ranches as well as existing government livestock stations.

The PROP indicates demonstrations will be carried out in the transition zone between the tropical lowlands and the Piedmont of the North Coast area as well as on government stations in the Llanos and in the North Coast area.

Two full time U.S. technicians will be located at CIAT in Colombia. Activities in other countries will be on a TDY basis unless other governments or Missions will provide funds for full time experts.

Reservation 6.

Explanation of how U.S. resources will be utilized.

Response 6.

Two experts will lead the demonstrations with participation by CIAT veterinarians. The activities requested from other countries will receive TDY advisory services as required. Texas A&M is prepared to recruit advisors on a full time basis if countries or missions require them and are prepared to fund such services.

Reservation 7.

Lack of outreach mechanism.

Response 7.

The demonstration is designed to make benefits highly visible. Advisory services are provided for other countries. A part of CIAT responsibilities is dissemination of information resulting from field demonstrations.

A Workshop for participants from Latin American and African countries is scheduled for March 17-21 in Colombia and another is planned for FY 76 in Africa.

Attachment

cc: TA/PM:Carl R. Fritz

no objections
J. Hancock
LA/DR/RD

UNITED STATES GOVERNMENT

Memorandum

TO : TA/PM - Mr. Carl R. Fritz

DATE: DEC 10 1974

FROM : LA/DR - Charles  Stockman, Jr.

SUBJECT: TA/AGR PROP - Control of Hemoprotozoal Disease

The Latin America Bureau concurs in principle in the purposes of the subject project, but has a number of serious reservations about the PROP:

1. The PROP does not describe the losses to the cattle industry and its relevance in the countries where the project is to be carried out. (The PROP has only a very general statement on this). It is therefore difficult to judge the relative importance of a project of this type in relation to AID priorities. What will be the benefits to the livestock industry and the LDC's if the project succeeds?
2. Measurements of goal achievement should be more specific. If there is going to be a measureable increase in livestock production efficiency, what is an estimated expected increase?
3. One of the conditions expected at end of project is "programs for premunition of cattle to protect them against the hemoprotozoal diseases will be in progress in Colombia, Brazil, Mexico, and Africa." Will these be demonstrations or programs? Since the project is a demonstration only, why would we expect programs to be underway at the end of this demonstration?
4. Another condition at end of project is that an adequate supply of quality biological agents and chemotherapeutic materials will be produced on a commercial basis. What is the input of the project which will bring this about? (The PROP states that the contractor prepare stable inoculums and stabilize challenge materials that will be used only during the demonstration period, it is presumed).
5. The apparent lack of host government involvement is a major deficiency. There is no description of how local technical personnel will be trained (or perform whatever role they have) in connection with the project. How many will be involved? How many cooperating ranches and government installations will be required? What part of the country is to be selected for project



area and why a particular area? Where will full time U.S. technicians be located, Colombia? Brazil? Mexico? and or Africa? To what extent is CIAT involved.

6. There should be a more detailed and specific description of how project will be carried out, specifically how U.S. resources will be utilized in the various locations.

7. A final major problem is the absence of any outreach mechanism to ensure application of the fruits of this project. A system should be built into the PROP that will show how utilization of the project results by the end beneficiaries is planned.

We recognize the need to field test a method of protecting cattle against hemoprotozoal diseases developed under an AID contract, but believe more information is needed as to impact on the live-stock industry if the technique is successful, an estimation of how a successful demonstration will indeed result in country programs for controlling hemoprotozoal diseases, time frame for controlling the disease, cost/benefits, and practicability. The PROP should be redrafted accordingly.

Demonstration to Utilize Research Results in
Premunition of Hemoprotozoal Disease

A. STATEMENT OF GOAL

1. The Goal

Improve the efficiency of livestock production in tropical and subtropical LDCs through the demonstration of effective control of hemoprotozoal diseases by premunition and ultimately by vaccination.

2. Measurements of Goal Achievement

A measurable increase in livestock production efficiency.

3. Assumptions about Goal Achievements

LDC governments will assist livestock producers by adopting non-discriminating economic policies, will disseminate information on technological advancements such as methods of disease and parasite control and will assist farmers in the implementation of effective control programs.

B. STATEMENT OF PROJECT PURPOSE

1. Purpose

The purpose of this project is to demonstrate under field conditions the protection of cattle against hemoprotozoal diseases utilizing the premunition and/or vaccination techniques developed in Colombia under a research contract, csd-1947, by Texas A & M University. Hemoprotozoal (blood parasite) diseases as a group cause the greatest handicap to livestock production in the tropics. These diseases result in death, delayed maturity, weight losses, and low levels of fertility. They also produce severe anemias which render animals vulnerable to malnutrition and other diseases.

2. Conditions expected at the end of the project.

a. Premunized animals will be proven to retain continuous immunity for a period of at least three years.

b. Adequate supply of quality biological agents and chemotherapeutic materials will be produced on a commercial basis.

c. Programs for premunition of cattle to protect them against hemoprotozoal diseases will be in progress in Colombia, Brazil, Mexico and several African countries.

d. CIAT will consider premunition as an Out-Reach project in LA.

e. A measurable decrease in mortality and a measurable increase in production and reproduction efficiency.

f. Liaison established with other centers (AVRO, ILRAD, ICIPE) and with the tsetse fly project in Tanzania.

3. Basic assumptions about achievement of purpose.
 - a. Cooperating livestock farmers and/or government agencies will provide sufficient animals for large scale field trials.
 - b. The contractor (Texas A&M University), CIAT and MinAg personnel have the competence to implement the project.
 - c. Adequate biological agents and chemotherapeutic material will be available for effective disease control.

C. STATEMENT OF PROJECT OUTPUTS

1. Outputs and output indicators
 - a. Outputs
Protection of animals against field and innoculant challenge with babesia and anaplasma agents.
 - b. Output Indicators
Proven immunity six weeks four months one year and 3 years after premunition.
2. Basic assumptions about production of outputs.
All cooperating entities will function effectively and AID monitoring will be constructive.

D. STATEMENT OF PROJECT INPUTS

1. Contractors
 - a. Preparation of stable inoculums of babesia and anaplasma organisms.
 - b. Stabilization of challenge materials.
 - c. Stockpile of necessary drugs for premunition techniques.
2. Coordinators
 - a. Adequate numbers of cattle and personnel, and facilities for handling cattle.
 - b. Personnel to be trained and to work with LDC governments, institutions and livestock producers.
3. Budget

	FY 75	FY 76	FY 77
Salary -			
Res. Veterinarian	\$ 17,000	\$ 18,020	\$ 19,102
Res. Assistant	9,000	9,540	10,113
Dir. Adm. Cost	1,000	1,060	1,124
Local Technicians	5,000	5,300	5,618
Local Labor	<u>6,000</u>	<u>6,360</u>	<u>6,742</u>
Total	\$ 38,000	\$ 40,280	\$ 42,699
Fringe Benefits	\$ 2,700	\$ 2,862	\$ 3,034
Allowance	6,000	6,000	6,000
Travel	7,500	5,000	7,500
Training Costs	2,000	3,000	3,000
Exp. Animals	5,000	3,000	---
Supplies & Operations	6,767	8,292	7,590
Indirect Costs	<u>6,175</u>	<u>6,546</u>	<u>6,940</u>
Total	\$ 36,142	\$ 34,700	\$ 34,064
Grand Total	\$ 74,142	\$ 74,980	\$ 76,763
Rounded To	\$ 75,000	\$ 75,000	\$ 75,000

E. RATIONALE

Research conducted to date under the AID-Texas-Colombian project AID/csd-1947 has resulted in methods which, under experimental conditions, have been proven to protect cattle from the hemoprotozoal diseases of anaplasmosis and babesiosis. These methods have proven effective in the protection of healthy cattle being introduced into infected areas or in the protection of young indigenous cattle in infected areas where exposure to these diseases is fairly constant.

In the absence of a true vaccine for these diseases, the method used involves premunition. Premunition constitutes the controlled infection of animals to make them clinically normal immune carriers. Since premunition depends upon a subclinical chronic infection, it works best where animals are constantly exposed to natural infection. Continuous exposure to diseases results from the continuous presence of infected insect vectors. There are many areas in the Tropics where the presence and prevalence of ticks and flies vary with the seasonal climate, rainfall and altitude of the ranges. Where exposure varies, the incidence of disease varies. While Texas A&M has experimentally demonstrated the effectiveness of the principles of premunition, there is a need to accelerate field applications of the method with appropriate modifications for given situations. These modifications involve the use of pathogenic, attenuated or killed organisms and therapy. Field demonstration with controls will not only establish the methods for different situations but will provide an essential opportunity to train local veterinarians and small farmers in methods appropriate for their area. Since small livestock producers usually lack the resources for tick control or repeated therapy, premunition applied to their situation offers the most practical method now available for the control of these diseases which now handicap production.

Recent experiments in an Anaplasma-Babesia endemic zone have conclusively proven the value of premunizing cattle being introduced into such areas. The value of this treatment was obvious when weight gains of premunized calves had gained an average of 102 pounds on pasture; whereas, the controls had averaged a 6 pound gain during the same period. This reflects a 50% death loss in the control group, even though they were young animals and naturally more resistant than older cattle. In 10 months the premunized calves had gained an average of 255 pounds as compared to 75 pounds for the controls. Transmission occurs readily in this endemic zone, so that calves born in this area are exposed within a few days or weeks. Premunition of indigenous calves in such an area is probably redundant since most of the cattle will have received a natural exposure.

There are, however, large areas of Latin America and Africa where the infection rate among adult cattle is 20 to 50%. In these areas, transmission may not occur in the first year of life, and may even be delayed for a period of years because of the sporadic occurrence of tick vectors. Under these circumstances cattle become extremely vulnerable when they reach ages in excess of 3 years and have never been exposed to Anaplasma or Babesia antigens.

The population of Colombia, estimated in 1971, at about 21 million, is concentrated in a relatively small area (intermediate zones). Here, more than 98% live on 35% of the land. In those areas there are large numbers of cattle belonging to numerous small owners who cannot afford dipping vats or spraying machinery to control the tick vectors of these diseases, who live with the constant threat of livestock diseases. Premunition of these cattle against anaplasmosis would probably confer a lifetime immunity. Babesia premunition, which is equally effective, will probably persist 1 to 2 years. The expense of premunition is low and could easily provide a method of control to owners having a small number of cattle that would be far more practical than the more expensive methods of vector control.

Preparations for the initial field premunition studies were initiated during the three months' period of May to June 1974, under AID/ta-c-1120 contract. They will continue for approximately four months more in the field in order to demonstrate a safe and effective field program.

F. COURSE OF ACTION

1. Implementation Plan

The herds in Colombia and possibly Brazil identified in April-June 1974 will be subject to premunition during the course of the demonstration beginning as soon as possible and continuing through June 1977. The schedule is as follows:

- a. Selection of farms on which the techniques will be tested.
 - 1). Moderately small holding are selected so that the entire cattle population on a single property can be kept under reasonable surveillance during the course of the experiment. Probably no more than 200 animal units.
 - 2). Ranch or farm should be located in a zone of sporadic hematropic disease problems with a 50 to 60% anaplasmosis incidence among adult cattle.
 - 3). Facilities for handling cattle need to be present.
 - 4). 10 to 20 farms and ranches located in 1 or 2 general areas with ready road access will be selected.
 - 5). An operation in which there is a reasonably stable cattle population with limited new cow introductions would be preferable. Estimated time - 3 months.
- b. Premunition - 80% of all cattle <24 months and > 4 months of age will be premunized; 20% will remain as non-premunized controls.
 - 1). Anaplasma marginale - one or more of the following methods will be used in A. marginale premunization:
 - a). virulent stabilate - no treatment - for cattle 12 months;
 - b). vaccination using a killed vaccine and then followed by virulent stabilate in cattle 12-24 months;
 - c). virulent stabilate followed by treatment to reduce severity in instances of severe reaction and in older cattle.

- 2). Babesia argentina and Babesia bigemina
 - a). exposure to virulent organisms
 - b). treatment with a non-sterilizing injection of Ganaseg. Estimated time - 1 year (January 1, 1975 to January 1, 1976).
- c. Evaluation of various premunization techniques. All cattle <24 and >4 months of age will be observed for possible differences between the treated and control groups.
 - 1). Following exposure weekly blood samples will be taken for 60 days to evaluate the effect of premunition.
 - 2). Parameters to be used:
 - a). Packed red cell volume.
 - b). Parasitemias - thick and thin blood smears
 - c). Serologic titers
 - d). Weight gains.
- d. Duration and efficacy of immunity
 - 1). After the initial 60 days post premunization, monthly observations will be made following the parameters previously listed D-2-a,b,c,d. In addition, relative reproduction efficiency of premunized and control cattle will be evaluated.
 - 2). Observations of control and premunized cattle will be made for 2 to 3 years to determine the value of this treatment.
 - 3). Premunization will become a regular practice for all calves over 4 months of age at each farm, but they will not be included in the initial experimental groups. This will be done at the regular monthly visits to each ranch.
 - 4). At 6-month intervals 2 control calves and 2 premunized calves will be intentionally challenged with virulent Anaplasma and Babesia to establish the degree of protection. Owners will be reimbursed for losses occurring in this challenge effort. Estimated time - 2½ years (January 1975 to June 1977).

Variations of the above outline will occur depending on the individual circumstances. If a large number of cattle 24 months of age are negative to Babesia and/or Anaplasma, an attempt will be made to premunize them, or remove them from the herd. Results are expected to be more meaningful and significant in young, growing cattle. One of the goals will be to maintain a uniformly infected herd of non-apparent carrier animals.

NARRATIVE STATEMENT

The research results in the control of hemoprotozoal diseases have stimulated an effective demand for a field scale demonstration of the potential benefits of application of the system. Texas A & M University has, under AID contract csd-1947, initiated the research leading to an apparent successful technique for controlling these diseases. It is now prepared to undertake a field scale demonstration of this technique in Colombia and possibly in Brazil with the cooperation of CIAT and the veterinary services of these countries.

The demonstration will cover a span of three years and aim at providing a factual evaluation of the economic benefits that may be derived. Documentation of the results will be published and disseminated throughout the areas of the world affected by hemoprotozoal diseases.

It is anticipated that this project will demonstrate the benefits of protecting animals against these diseases and will assist AID Missions, regional bureaus and the developing countries in establishing animal health programs which will contribute to increased efficiency in the production of animal products. It will also provide a training ground for technicians from other parts of the developing world in a system for controlling a seriously debilitating disease.

EVALUATION PLAN

This project was reviewed and evaluated by TAB Research and Development Committee on October 15, 1975 and approved with no changes. It was subject to initialing of the PROP by the LA Bureau for concurrence in the sites (Colombia/Brazil). The plan of action to evaluate the contractor's performance follows:

1. Technical reviews will be conducted annually and periodically in each year when seminars, workshops or evaluation panels are convened for related projects. The first of these will be in conjunction with the Hemoprotozoal Disease Workshop at CIAT scheduled for March 17-22, 1975.

Technical reviews will be made by a technical committee composed of the Project Manager, representatives of TA/PM, TA/AGR, Regional Bureaus, Contracting Office, other agencies and outside consultants.

A project appraisal report will be submitted by the Project Manager within 30 days.

2. An in-depth Technical and Policy Evaluation of the project will be made in October 1976 by the Technical Committee.

The findings and recommendations will be presented to the TAB Research and Development Committee for deliberation and comments for extending the services contract.

Worldwide Technical Assistance and Research

FY 1975/76 Technical Assistance Bureau Program Submission
Project and Budget Analysis Matrix

Obligation: Initial FY 1974 Final FY 1977

Service ; Start FY 1974 End FY 1977

AC/PROCP Status: Project approved thru FY 75
Section 2(j)(d): Project approved thru FY 79
Evaluation Scheduled

Month Year Type

Livestock
Project Hemoprotozoal Control
Country/Region Colombia / Brazil
Name Texas A & M University
Project Officer N. Is Kennerly Extension 23372

Major Country/Countries

Colombia / Brazil

On-Going Only.

Narrative	Objectively Verifiable Indicators	
<p>PURPOSE: The purpose of this project is to demonstrate under field conditions the protection of cattle against hemoprotozoal diseases utilizing the pre-munition and/or vaccination techniques developed in Colombia under a research contract, csd-1947, by Texas A & M University.</p>	<p>B2 End of Project Status: Proven immunity at end of 3 years. Measurement of efficacy by increase in weight and value of animals over controls.</p>	<p>B3 Progress to Date: Pre-program planning with CL/T/RF/ICA. Identification of sites in Colombia, Brazil and possibly Mexico.</p>
<p>OUTPUTS: Protection of animals against field and innoculant challenge with babesia and anaplasma agents.</p>	<p>C2 Output Indicators: Proven immunity six weeks four months one year and 3 years after pre-munition.</p>	<p>C3 Progress to Date: Proposed sites evaluated to determine relative infection levels with in cattle herds.</p>

INPUTS:
Preparation of stable inoculums of babesia and anaplasma organisms. Stabilization of challenge materials. Stockpile of necessary drugs for pre-munition techniques.

D2 Budget Summary (in thousands of dollars)

All Prior Year	(1) (2) (3) (4) (5) (6) (7)							(8)
	Personnel Dollars	Commodities	Other Costs	Total	Expenditures	June 30 Pipelin.	Funding Period Month Y	
1. Thru FY 1973								
2. Actual FY 1974								
3. Estimated FY 1975*	38	66	12	25	75			
4. Proposed FY 1976 *	40	66	11	24	75			
5. All other	42	66	8	25	75			
6. Total:					225			

* FY 1975 Congressional Presentation level.

Expenditures are to be computed on an accrual basis.