PD-AAI-481

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REPORT OF PROGRESS ON COOPERATIVE GUYANA AGREEMENT

USAID 211(d) GRANT ON TROPICAL RUMINANT LIVESTOCK PRODUCTION Consortium

July 1, 1974 - December 31, 1974

A major data collection activity in Guyana was undertaken by the various members of the 211(d) Consortium in Guyana during the first six months of 1974. Therefore, there was no in-country activity during the six month period covered by this report. Work was focused on the tabulation and analysis of data obtained during the first half of 1974, on the integration of this additional information into the modelling activities of Texas A&M and Purdue University, and on further development of the herd model by Texas A&M and the industry model by Purdue. As data tabulation, analysis, and modelling efforts progressed additional information needs were identified, and plans were made for additional field work in early 1975. Communication among Consortium members has been maintained through exchange of reports, direct communication for exchange of ideas and through Consortium meetings. Specific activities and progress of individual Consortium members will be discussed below.

Texas A&M University

Data collected on beef cattle production by J.M. Davis at Ebini, Matthews Ridge, and the Rupanuni supplemented by data from the World Bank Project have been organized. Data has been punched on computer cards. These data will be used to establish a basis for simulating alternative beef cattle production systems in the Texas A&M model. Data

were also made available to Purdue for use in development of production alternatives for initial runs with the industry model.

The Texas A&M herd model was completed to an initial stage and subjected to validation. Although the model performed well in the validation test, further consideration of actual production conditions in Guyana led to the conclusion to modify the nutritional component rather intensively and to make minor modifications in the reproduction component. The herd composition component did not require alteration.

Modifications to the model will be completed during the first half of 1975 and testing and validation of the model will be initiated. As soon as this step is completed alternative production systems will be evaluated. These simulations will be choosen to be feasible for Guyana and with parameters appropriate with the various regions of Guyana.

The veterinary personnel at Texas A&M concentrated on analysis of data obtained in their livestock disease survey in Guyana. Preliminary findings were organized into a report which was made available to other members of the Consortium and to Guyana. Work has continued on analysis of sample results and a final report will be forthcoming during the first half of 1975.

Tuskegee Institute

Data was punched on computer cards and tabulations made and organized into a preliminary report of findings from the livestock producer survey conducted in the summer of 1974. The questionnaire used in this survey had input from all members of the Consortium and was especially designed to provide data needed by Tuskegee in their work on sociology and extension, and by Purdue and Texas A&M in definition of production

systems. A preliminary summary of findings was made available to Consortium members and to Guyana. In addition, the raw data pertaining to production practices were made available to Purdue University for further analysis and incooperation into the industry model. Plans were made for a survey of livestock extension workers. This survey will be conducted during the first half of 1975.

University of Florida

A workshop was organized and conducted at Gainesville in August of 1974. The purpose of this workshop was to discuss the approach to modeling of forage production systems. Representatives from the four member institutions participated in the workshop. Tentative agreement was reached on the critical aspects of forage production and nutrient inputs necessary to represent livestock nutrition in the production systems for both the Texas A&M and Purdue models. Mott and Conrad, drawing upon Florida's prior experience in Guyana and in the tropics in general, have served as resource persons for Texas A&M and Purdue in their modelling of livestock production systems.

Purdue University

Emphasis has been on development of the industry model for Guyana. Data obtained during the summer of 1974 by Purdue, Texas A&M and Tuskegee as a result of field work conducted in Guyana were organized and used as a basis for structuring both production and marketing aspects of the model. Additional data needs were identified and plans made for more field work to be conducted in the first half of 1975. A conceptual framework for the industry model was developed and programming of the computer model was initiated. A sub project for economic

analysis of alternative sizes for slaughter facilities has been initiated. Preliminary discussion were carried on with Mr. Dukhia of the University of Guyana with respect to the conduct of a study of beef demand in Guyana. The initial version of the Texas A&M model was converted from DYNAMO to FORTRAN to facilitate utilization on the Purdue computer and linkage with the Purdue model. The FORTRAN version was made available to Texas A&M and subsequent work will be done in FORTRAN.

The plans for the first half of 1975 include additional field work to obtain necessary information to complete modeling, initiation of the beef demand study, completion of the economies to size study for slaughter facilities, and completion of the industry model in a preliminary form. The industry model will be used in a workshop framework with Consortium members in the U.S. to identify major problems and deficiencies. A workshop in Georgetown will then be organized for evaluation of the model in cooperation with the Guyanese. This will provide a basis for further modification and improvement of the model as a policy analysis tool.

JULY 1973 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

Livestock Consortium

3 copies

TO : Review Committee

DATE: April 5, 1976

FROM : TA/AGR, Leon F. Hesser

SUBJECT: Issue Papers on Four Universities

Issues raised in respect to the four Universities are common in many cases. However, a few are related to the particular special disciplines with which each of the institutions are dealing

Three issues are particularly significant to all of the participating institutions.

1. What are the institutions capability for effectively absorbing grant funds and at what funding level? this question is related to normal staff availability, incremental staffing and the question of incremental staff tenure.

2. What is the projected demand for consortium services? This is in part an issue for AID/W determination and poses a serious policy determination on extension, expansion, or phasing down of the current activities.

3. What will be the effect of Title 12 legislation in respect to AID's Foreign Assistance policies? Will 211(d) continue to be a part of AID programming or will the new legislation supplant this system.

The issues raised for guidance to the review committee do not preclude the development of by committee issues it considers relevant.

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

ISSUES PAPER
Texas A&M University
Comprehensive Review -- 211(d) Grant
April 26 & 27, 1976

To develop U.S. institutional capability and competence in the husbandry of ruminant livestock in tropical areas, AID has made four grants to U.S. institutions. The four institutions agreed to cooperate (act as a consortium) in the development of a multi-disciplinary approach to research and technical assistance on ruminant livestock production systems for the wet/dry tropics. Among these is the 211(d) grant to Texas A&M University, where the AID support has the objective of increasing staff capability and competence of the Animal Science Department and Institute of Tropical Veterinary Medicien; to improve competency relating to livestock breeding and selection as a component of a production system; to design and conduct diseases prevention and control programs for ruminant animal production.

Among the feature of Texas A&M which led to this selection by TA/AGR is Texas A&M's demonstrated commitment to assisting agencies working in the international community.

The issues raised herein relate primarily to the management of the grant, progress toward the objective, and Texas A&M's future directions and involvement with AID in the developing countries.

More specifically, the issues intend to evaluate how AID funds have been used to develop Texas A&M's (Department Concerned) capability as stated in the objective.

For the purpose of this review, the issues must be considered in the context of tangible achievements (outputs or impact) vis-a-vis the magnitude of the funds expended. The issues have been prepared in consultation with TAB Grants Coordinator and are within the requirements for the Comprehensive Review as outlined in Grant Handbook (3, App. 2-C, and in compliance with Agency policies recently established by the Administrator in PD-62 (documents attached).

While these issues will be used by the Chairman in structuring the review, they do not preclude the discussion of other issues which the Review Committee and Texas A&M may wish to raise.

Issue 1 - How has staff competence been strengthened in quality, specialization, and quantity relative to the purpose of the grant?

How has Texas A&M's knowledge base been enhanced since 1972 relative to; animal breeding and selection systems, diagnosis of tropical animal diseases, design and conduct of disease prevention or control programs?

What advisory capacities exist now which did not exist at the time of the grant?

Has Texas A&M initiated policy changes that will permit utilizing the capability resulting from this grant?

Issue 2 - Quantitatively, what progress has been made since 1972 in library resources (acquisitions of research and other relevant publication) in new graduate course designed and instituted, in linkages with national (US-LDC) and international institutions? (Data on the above should be related to the Departments involved in the Grant).

To what extent did the expenditure of time and funds on the survey in Botswana Guyana contribute to the objectives of the grant? To what degree was the Guyana survey relevant to the systems model?

Issue 3 - Is the consortium approach, so far as Texas A&M is concerned, a valid method to develop multi-disciplinary instituinal capability to meet AID needs in LDCs? Will this approach require a continuing (modified) input from AID to assure availability of this resource for animal production programs in LDCs?

Issue 4 - What future direction and involvement is Texas A&M prepared to consider and to undertake? How will Texas A&M continue to maintain the capability resulting from the Grant?

Issue 5 - What is AID's projection of potential demands on Texas A&M and the consortium for services in LDCs?

What grant-supported activities will be assumed by the Texas A&M ~~for~~ funded from other sources?

INPUT FORM FOR GUYANA LIVESTOCK MODEL

Card 1

Format (6I3), IY,NT1,NT2,NT3,NT4,LY

(1) Number of Years Coefficients Needed in Current Run (IY).

(2) Number of Technologies in Rupununi Area (NT1).

(3) Number of Technologies in Matthews Ridge Area (NT2).

(4) Number of Technologies in Ebini Area (NT3).

(5) Number of Technologies in Coastal Area (NT4).

(6) Last Year's Results that will be reported in this run (LY).

Card 2

Format (5I3), K,IA,IT,IACT,IP

(1) Type of Activity (K)

1 - Production

2 - Development

3 - Demand and Supply Curves

4 - Right Hand Side

(2) Area (IA)

1 - Rupununi

2 - Matthews Ridge

3 - Ebini

4 - Coastal

(3) Technology Number (IT) (Max = 9)

Cow herds within an area are divided into different technologies to reflect the difference in the ability of the animals to respond to inputs and improved conditions. There may be one or many activities associated with one technology. Cows of the same technology perform differently uder varying management schemes which are reflected as different activities under the same technology. In contrast, the same management scheme may result in differing performance when the abilities of the animal to respond (technology) are different.

(4) Activity Number (IACT) (Max = 9)

Numbers 1 through 9 can be used to identify activities that are identical with respect to all other identification coefficients on this card.

(5) Specific Type of Activity (IP)

(a) Production Activity Identifiers

1 = Cow-Calf - Sell all calves

2 - Cow-Calf - Sell bull calves and 3 yr. heifers

3 - Cow-3 yr. steer - Sell 3 yr. heifers

4 - Cow-Steer - Sell 3 yr. heifers

5 - Cow-Calf - Sell bull calves and keep 3 yr. heifers

6 - Cow-3 yr. Steer - Keep 3 yr. heifers

7 - Cow-Steer - Keep 3 yr. heifers

8 - Cow-Calf - Sell bull calves and buy 3 yr. heifers

9 - Cow-3 yr. Steer - Buy 3 yr. heifers

10 - Cow-Steer - Buy 3 yr. heifers

Production Activity Data

Cards 3 - 30

I. Performance Variables:

Format (5F10.0)

	No. on Hand	Average Weight	Annual Death Loss (%)	Number Sold	Annual Theft Loss (%)
Breeding Bulls					
Brood Cows					
Bull Calves					
Heifer Calves					
Heifers (2 yr.)					
Heifers (3 yr.)					
Steers (2 yr.)					
Steers (3 yr.)					
Steers (4 yr.)					
Steers (5 yr.)					
Steers (6 yr.)					
Steers (7 yr.)					

II. Resource Utilization:

A. Land (Format (4F15.0))	Acres/Native	Acres/Improved
(1) Type I and II	_____	_____
(2) Type III f	_____	_____
(3) Type III	_____	_____
(4) Type IV	_____	_____

(Format (6F10.0))

(5) Acres Rented (acres) _____

(6) Annual Rental ($/yr.) _____

B. Labor:

(1) Permanent employed farm labor (men) _____

(2) Annual salary for above labor ($/yr.) _____

(3) Annual temporary hired labor used (hrs.) _____

(4) Hourly wage rate of temporary hired labor ($/hr.) _____

(5) Farm managers required (men) _____

(6) Annual salary for managers ($/yr.) _____

(7) Annual salary for Assistant Manager ($/yr.) _____

(8) Administration ($/yr.) _____

C. Machinery:

(1) Farm machinery (hours) _____

(2) Large trucks (no.) _____

(3) Land Rovers (no.) _____

(4) Stock handling maintenance ($/yr.) _____

(5) Ranch building maintenance ($/yr.) _____

(6) Farm machinery maintenance ($/hr.) _____

(7) Fence maintenance ($/yr.) _____

(8) Road and track maintenance ($/yr.) _____

III. Purchased Inputs:

A. Feed Supplements	(cwt.)	($/cwt.)
(1) Salt	_____	_____
(2) Minerals	_____	_____
(3) Protein Supplement	_____	_____
(4) Corn	_____	_____
(5) Bone Meal	_____	_____
(6) Rice Bran	_____	_____
(7) Wheat Middlings	_____	_____
(8) Urea	_____	_____
(9) Molasses	_____	_____
(10) Copra Meal	_____	_____
(11) Supplements for Horses	_____	_____

B. Pasture Maintenance	(cwt.)	($/cwt.)
(1) Nitrogen	_____	_____
(2) Phosphate	_____	_____
(3) Potassium	_____	_____

IV. Herd Health

A. Practice	No. of Treatments per Year	Total Costs per Treatment
Drenching	_____	_____
Dipping	_____	_____
Spraying	_____	_____
Vaccinate:		
Anthrax	_____	_____
Blackleg	_____	_____
Leptospirosis	_____	_____

	No. of Treatments per Year	Total Costs per Treatments
A. Practice (cont'd)		
Vaccinate (cont'd)		
Foot and Mouth	_____	_____
Rabies	_____	_____
Other _____	_____	_____
_____	_____	_____
Foot Bath	_____	_____
Worming	_____	_____
B. Annual hours of Veterinary Services Used		_____

C. Castration Procedure:

Clamp	_____	(1)
Bands	_____	(2)
CAP	_____	(3)
Complete	_____	(4)

D. Breeding System:

(1) A.I. _____ Cost ($/hd.) _____

(2) Natural _____ Bull/Cow Ratio _____

(3) Seasonal Breeding* _____ (mo.) to _____ (mo.)

(4) Continuous Breeding* _____ (mo.) to _____ (mo.)

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* Put in months when most calves are born - January = 1, and December = 12.

V. Dairy:

A. Milk

(1) Annual sales of milk (gallons) _____

(2) Milking labor employed (men) _____

(3) Annual milking labor costs ($/men) _____

(4) Annual supplies cost for milking operation ($) _____

Country-wide Constraints

Cards 2 - 4

I. Purchased Inputs

Format (6F10.0)

	(tons/yr.)
A. Salt	_____
B. Minerals	_____
C. Mixed Feeds	_____
D. Corn	_____
E. Bone Meal	_____
F. Rice Bran	_____
G. Wheat Middlings	_____
H. Urea	_____
I. Molasses	_____
J. Copra Meal	_____
K. Supplement for Horses	_____
L. Nitrogen	_____
M. Phosphate	_____
N. Potassium	_____

Regional Constraints (RHS)

Cards 5 - 11

1. Initial Herd

Format (6F10.0)

A. Breeding Cows

(1) Technology 1 _____

(2) Technology 2 _____

(3) Technology 3 _____

(4) Technology 4 _____

(5) Technology 5 _____

(6) Technology 6 _____

(7) Technology 7 _____

(8) Technology 8 _____

(9) Technology 9 _____

II. Land and Pasture

(acres)

A. Type I and II Land

(1) Unimproved _____

(2) Improved _____

B. Type IIIf Land

(1) Unimproved _____

(2) Improved _____

C. Type III Land

(1) Unimproved _____

(2) Improved _____

D. Type IV Land

(1) Unimproved _____

(2) Improved _____

III. Labor Available

A. Permanently employable farm labor (men) _____

B. Available temporary farm labor (hrs. per yr.) _____

C. Farm managers and assistants (men) _____

D. Skilled labor (hrs. per yr.) _____

IV. Transportation and Machinery

A. Farm machinery available (hours/yr.) _____

B. Plane transportation capacity (tons/yr.) _____

C. Boat transportation capacity (tons/yr.) _____

D. Truck transportation capacity (tons/yr.) _____

V. Services

A. Veterinary services capacity (hrs. per yr.) _____

B. Artificial Insemination capacity (herd/yr.) _____

C. Slaughter plant capacity (herd/yr.) _____

VI. Development Restrictions

A. Fencing (miles) _____

VII. Regional Demand (tons/yr.)

A. Regional milk demand _____

B. Regional meat demand _____

TABLE 1. SIMULATED AGES AT FIRST ESTRUS OF HEIFERS OF THE SAME MATURE WEIGHT (480 kg), WITH DIFFERENT WEIGHTS AT 240 DAYS AND DIFFERENT RATES OF GAIN AFTER 240 DAYS OF AGE.

Weight at 240 days of age, kg	Daily weight gain, kg						
	.1	.2	.3	.4	.5	.6	.7
150	-	1335	834	553	465	423	397
160	-	1266	727	502	436	403	383
170	-	1191	601	461	412	385	372
180	-	1066	5[illegible]	425	389	370	[illegible]
190	2007[a]	819	449	394	369	361	355
200	1728[a]	548	399	372	359	353	349
210	1321	435	376	359	352	347	343
220	875	387	360	350	345	341	338
230	548	363	349	343	340	336	334
240	393	350	342	338	335	333	332

[a]Based on heifers that reached puberty by 2250 days of age.

TABLE 2. SIMULATED WEIGHTS AT FIRST ESTRUS OF HEIFERS OF THE SAME MATURE WEIGHT (480 kg), WITH DIFFERENT WEIGHTS AT 240 DAYS AND DIFFERENT RATES OF GAIN AFTER 240 DAYS OF AGE.

Weight at 240 days of age, kg	Daily weight gain, kg						
	.1	.2	.3	.4	.5	.6	.7
150	-	369	328	275	262	260	260
160	-	365	306	265	258	258	260
170	-	360	278	258	256	257	262
180	-	345	262	254	254	258	266
190	367[a]	306	253	252	255	263	270
200	349[a]	262	248	253	260	268	276
210	318	249	251	257	266	274	282
220	283	249	256	264	272	281	289
230	261	255	263	271	280	288	296
240	255	262	271	279	288	296	304

TABLE 3.. SIMULATED FERTILITY OF TWO-YEAR-OLD COWS DURING A 180 DAY BREEDING SEASON, BEGINNING IMMEDIATELY AFTER CALVING, WHERE ALL COWS ARE OF THE SAME GENOTYPE (WMA =480 kg), BUT HAVE DIFFERENT POSTPARTUM WEIGHTS AND RATES OF WEIGHT GAIN.

Postpartum weight, kg	Daily gain, kg	Estrus during first 90 days, %	Conceived during first 90 days, %	Estrus during breeding season, %	Conceived during breeding season, %
335	-.4	20	11	20	11
	-.2	38	23	44	31
	0	56	38	83	71
	.2	73	53	98	93
	.4	86	67	100	99
360	-.4	52	35	58	44
	-.2	68	49	85	75
	0	82	63	98	94
	.2	92	75	100	99
	.4	97	84	100	100
385	-.4	73	52	88	79
	.2	88	71	98	95
	0	96	81	100	99
	.2	99	89	100	100
	.4	99	89	100	100
410	-.4	93	78	99	96
	-.2	98	85	100	99
	0	99	88	100	100
	.2	99	89	100	100
	.4	99	89	100	100
435	-.4	98	85	100	99
	-.2	99	88	100	100
	0	99	89	100	100
	.2	99	89	100	100
	.4	99	89	100	100

TABLE 4. SIMULATED CONCEPTION PERCENTAGES DURING AN 80 DAY BREEDING SEASON, BEGINNING AT 370 DAYS OF AGE, WHERE ALL GROUPS OF HEIFERS ARE OF THE SAME GENOTYPE (WMA=480 kg).

Daily weight gain, kg	Weight at 360 days of age, kg					
	220	230	240	250	260	270
0.0	11	26	45	65	78	87
.1	15	32	52	71	83	90
.2	20	39	59	77	87	92
.3	27	47	67	83	91	94
.4	35	56	74	88	93	95
.5	45	65	81	91	94	95
.6	55	74	87	92	94	95
.7	65	80	89	92	94	95