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9. ABSTRACT

This study focuses primarily on beef and dairy cattle production in Guyana, with data on swine, poultry, sheep, and goat producers also collected. Specifically, the following types of information were provided: 1) socio-economic profile of livestock producers, 2) characteristics of land use, 3) breeding program, 4) herd health data, 5) nutritional information, 6) marketing practices, 7) involvement with and attitudes toward livestock extension programs. As a result, one hundred twelve livestock producers were interviewed during the survey. Table I presents the number of interviews from each of the two major geographical areas and each of the sub-areas. Forty-two (38%) of the respondents were from the Rupununi District and seventy (63%) were from the Coastal area. With regard to the sub-areas, a substantial portion of the interviews in the Rupununi were from each of the sub-areas. On the Coast there was more of a concentration of producers; twenty-five (35.7%) of Coastal respondents were from East Coast Demerara.

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APPENDIX I

211-d Livestock Project
Carver Research Foundation
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Department of Agricultural Sciences

SURVEY OF LIVESTOCK PRODUCERS IN GUYANA

Conducted in Cooperation with
The Guyana Ministry of Agriculture and National Development
and
The United States Agency for International Development

by

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June 29, 1975

Purpose of Study

The purpose of the present study is to provide the Tuskegee Institute faculty who are responsible for extension planning, specifically associated with livestock development in the tropics, with a description of livestock attitudes of the Government and producers in Guyana, South America. Such information would not only be useful to the Government of Guyana, but would strengthen the faculty of Tuskegee Institute in evaluating past and present programs in the tropics, especially where extension and sociological implications are major constraints to development. This expertise would hopefully be used in development planning by governments of tropical countries, USAID and other donor agencies. This is especially true when the systems approach to development is considered. Tuskegee Institute is conducting this study as a part of the 211-d institutional grants (USAID) which involve four U. S. universities. This consortium of universities considers extension, sociology, economics, breeding, nutrition, forage production and animal health. Constraints within the total livestock systems are identified and methods to reduce or eliminate these constraints are considered.

INTRODUCTION

Since gaining its political independence on May 26, 1975, Guyana has been seeking ways to strengthen its economy through the development and support of agricultural enterprises. This is an attempt by Guyanese to attain economic independence.

Before independence, Guyana was essentially an economic monoculture with sugar cane being the principle earner of foreign exchange. Also according to recent statistics, bauxite, rice, and shrimp are other exports which are significant earners of foreign exchange. The major aim of the present government is to continue to strengthen these enterprises and become self-sufficient in agriculture. This will require a great deal of expansion and diversification in the many areas of agricultural production.

Livestock production is one of the agricultural areas which has been selected by the Government of Guyana to receive increased developmental support. The Ministry of National Development and Agriculture, through the use of various financial programs, is attempting to increase the quantity and quality of livestock and livestock products. This increase in production will be assisted through research activities, and implemented by extension efforts. Major emphasis is being placed on beef and dairy cattle production, however swine and poultry production is receiving a great deal of attention. Livestock production activities will attempt to improve methods for production of beef cattle owned by individual farmers as well as large private cattle producers (i.e. the Rupununi Development Company). Other activities will include the following:

I. Establishment of cooperatives for small livestock producers

II. Developing new corporately owned ranches between the private sector of the economy and the government (i.e. the Livestock Development Company).

III. Establishing Government Owned Herds

Major funds to support such developments in beef cattle production are being provided by the Livestock Development Project (LDP). These funds are provided by the World Bank and are presently limited only to supporting the development of beef cattle projects.

Through its livestock veterinary extension activities, the Ministry of Agriculture is initiating activities to improve livestock management, marketing, breeding, herd health and nutrition.

The Ministry has a professional staff composed of veterinarians, livestock officers, veterinary assistants and livestock assistants in order to provide assistance to livestock producers throughout the country. Despite the experience of this staff, the government is short of professional help and continues to provide financial support for qualified individuals to receive advanced animal science and veterinary training at foreign institutions. This is evidence that the government is committed to the development of a viable livestock industry. In addition to this advanced training, the Guyana School of Agriculture continues to train students in a two year program in agriculture. A recent innovation was the training of para-professionals in livestock management. This two-year activity was conducted at Tuskegee Institute with financing from USAID. Because of the diversity of this type of training, trainees are now employed in many aspects of the livestock industry (i.e. ranch managers, extension livestock and veterinary assistants and individual farmers).

Likewise, in the marketing areas the Government has fostered livestock development by operating government owned abattoirs, establishing a government owned marketing operation (Guyana Marketing Corporation), and by various ways encouraging the development and growth of Meat Marketing Ltd. (a privately owned marketing company). These efforts are extremely important because for most of Guyana, the traditional marketing system is geared to small local markets and there is certainly a need to shift to a national market. The Government of Guyana, through its Ministry of National Development and Agriculture, has made a firm commitment to the development of agriculture and is moving forward with its efforts.

Scope of Study

The Tuskegee Institute Project Staff, in consultation with personnel from the Ministry of National Development and Agriculture, decided that the study would focus primarily on beef and dairy cattle production in Guyana. However, data on swine, poultry, sheep and goat producers would be collected during the study. Specific aspects to be studied during the random survey of producers would be their socio-economic characteristics of land use, herd characteristics, herd health, nutrition, marketing practices and producers' involvement with an attitude toward the extension efforts of the Ministry of Agriculture. Specifically, the study was to provide the following types of information:

1. Socio-economic profile of livestock producers. The profile contains such variables as age, sex, marital status, educational attainment, occupation, ethnic identity, and income.

2. Characteristics of land use. The principal focus of this section is size of acreage owned and/or rented, length of tenure, and present usage of land.

3. Breeding Program. This portion of the survey reports data which

describes the use of improved breeds, type of breeding (natural vs. A. I.), calving percentages, age of breeding, season of breeding and weaning program.

4. Herd health data. These data describe the methods used to prevent and control diseases and parasites.

5. Nutritional information. These data should describe the management programs involved in feeding livestock and will include pasture programs and the use of supplemental feeds, vitamins and minerals.

6. Marketing practices. These data should answer questions related to the number of livestock units sold, the marketing procedures used, and evaluate the general attitude of producers on the price received for their product.

7. Involvement with and attitudes toward livestock extension programs. This aspect of the study evaluates the producer's knowledge of livestock extension programs, his involvement in these extension programs and knowledge of other government programs which relate to his current and anticipated needs, and his attitude toward these programs.

The Tuskegee Institute 211-d project staff had limited personnel, time and financial resources. Furthermore, it lacked a sampling base necessary to conduct a geographically comprehensive and statistically significant study of all livestock producers in the country. Therefore, in consultation with Ministry personnel, it was decided to survey only those geographical areas that had significant numbers of livestock producers. Thus the Rupununi District and large portions of the coastal areas were selected.

Because of the historical, current and future importance of the Rupununi District to Guyana's beef cattle industry a major effort was made to do a complete enumeration of beef cattle producers in certain areas of this district. Unfortunately, this was not possible. A scarcity of vehicles, gasoline and support personnel limited this effort. Despite this situation, interviewers were able to talk with a significant number of producers and it is reasonable to assume that the findings of the survey are representative of the Rupununi District as a whole. The staff was able to cover most of the villages from

Karasibai and Annai in the North to Aishalton in the South. With minor variations the life style of the people and the characteristics of the herds were quite similar throughout the district.

The Coastal area presented a different problem. While the Rupununi is sparcely settled and livestock producers were known and fairly easy to locate, most of the Coast is densely settled and livestock production is found throughout. Due to certain limitations a complete enumeration study was not possible. As a sampling technique, it was decided to interview each livestock producer in every tenth half mile of the Coastal highway. Using a random start the interviewer marked off a half mile distance along the highway and would attempt to interview every livestock producer within this area. Once this was completed the interviewer would travel four and one-half miles further along the highway and repeat the process. This was facilitated by using the mileage posts existing along the highway. The Coastal areas surveyed were East Bank Demerara, West Coast Demerara, West Coast Berbice, East Bank Berbice, Canje and Upper Corentyne, Lower Corentyne and Black Bush Polder. As expected some of the half mile sample areas did not contain producers. The procedure used should have provided a statistically valid sample of the areas studied.

The samples from the Rupununi and Coast should therefore provide a fairly comprehensive view of livestock producers and livestock production in Guyana.

One final point about the sample should be made. The interviewers reported that they were having some difficulty in obtaining truthful data from some respondents along the Coast. The Rupununi posed no difficulty along these lines; respondents were most cooperative. Apparently, some respondents believed that the interviewers were from the government and were gathering information for tax and other purposes. Thus some of the questions on marketing, income, etc.

were underreported. It is reasonable to assume that the number of livestock producers in the sample areas along the Coast is underestimated. The interviewers felt certain that a number of persons whom they encountered met the study's definition of livestock producers, but because of fear did not want to be interviewed.

Results

One hundred twelve (112) livestock producers were interviewed during the survey. Table I presents the number of interviews from each of the two major geographical areas and each of the sub-areas. Forty-two (38 percent) of the respondents were from the Rupununi District and seventy (63 percent) were from the Coastal area. With regard to the sub-areas, a substantial portion of the interviews in the Rupununi were from each of the sub-areas. On the Coast there was more of a concentration of producers; twenty-five (35.7 percent) of Coastal respondents were from East Coast Demerara.

TABLE I

NUMBER AND PERCENT OF RESPONDENTS FROM EACH OF THE MAJOR GEOGRAPHICAL AREAS AND SUB-AREAS

	F	%
Geographical Area		
Rupununi District	42	38
Coastal Region	70	63
Total	112	101
Geographical Sub-Area		
North Rupununi	24	21
South Rupununi	18	16
East Bank Demerara	10	9
West Bank Demerara	3	3
East Coast Demerara	25	22
West Coast Berbice	9	8
East Bank Berbice, Canje and Upper Corentyne	10	9
Lower Corentyne	9	8
Black Bush Polder	4	4

Table II reports livestock producers by the type of livestock produced for each of the areas and sub-areas. Only cattle producers were reported in the Rupununi. In the Coastal area one-half of the producers were cattle producers, one-third were swine producers, sixteen percent were poultry producers and about one-fourth had sheep and goats.

Also reported in Table II is a distribution of producers of each of the types of livestock for each of the geographical sub-areas. Over half of the cattle producers were found in the two Rupununi sub-areas. This is not to say that farmers in the Rupununi do not have livestock other than cattle. Sheep, goats, chickens, and swine are seen in the Rupununi, but they are not raised commercially; they are for domestic use.

On the Coast, East Coast Demerara, West Coast Berbice and East Bank Berbice (including Canje and Upper Corentyne) contained the largest number of cattle producers. East Bank Demerara and West Bank Demerara contained the smallest number of cattle producers, each having only one percent.

Swine production was concentrated in East Coast Demerara (38 percent) East Bank Demerara (29 percent) and Lower Corentyne (13 percent). All other sub-areas had less than ten percent of the producers. No swine producers were interviewed in the Black Bush Polder area.

East Coast Demerara and East Bank Demerara were also the areas where the largest number of poultry producers were interviewed; thirty-six percent of the producers were found in East Bank Demerara and twenty-seven percent in East Coast Demerara. East Bank Berbice and Lower Corentyne each contained eighteen percent of the poultry producers. There were no poultry producers interviewed in three Coastal sub-areas: West Bank Demerara, West Coast Berbice and Black Bush Polder.

Half of the sheep and goat production was concentrated in Lower Corentyne

TABLE II

GEOGRAPHICAL DISTRIBUTION OF PRODUCERS BY TYPE OF LIVESTOCK PRODUCED

	Type of Livestock			
	Cattle[1] (78)	Swine[2] (24)	Poultry[3] (11)	Sheep/Goats[4] (17)
Geographical Area				
Rupununi District[5]	54	0	0	0
Coastal Area	46	100	100	100
Geographical Sub-Area				
North Rupununi	23	0	0	0
South Rupununi	31	0	0	0
East Bank Demerara	1	29	36	0
West Bank Demerara	1	8	0	6
East Coast Demerara	14	38	27	21
West Coast Berbice	10	8	0	18
East Bank Berbice, Canje and Upper Corentyne	10	4	18	18
Lower Corentyne	4	13	18	19
Black Bush Polder	5	0	0	6

[1]A respondent was classified as a cattle producer if he owned five or more head of cattle.

[2]A respondent was classified as a swine producer if he owned five or more swine.

[3]A respondent was classified as a poultry producer if he had a flock of 1,000 birds.

[4]A respondent was classified as a sheep/goat producer if he had a herd of ten or more sheep and/or goats.

(29 percent) and East Coast Demerara (21 percent). The rest of the sheep and goat producers were scattered in the other coastal areas. The only coastal sub-area where no sheep and goat producers were interviewed was West Bank Demerara.

The Coastal area which had the most diverse mixture of livestock producers was East Coast Demerara. Black Bush Polder had both the least number of producers and the least amount of diversity in livestock production enterprises.

Socio-economic Characteristics of Livestock Producers

Selected socio-economic characteristics of the producers were examined controlling for geographical area and type of livestock produced. The findings are reported in Tables III-V.

Table III reports the selected social characteristics of the total sample of livestock producers and for each of the major geographical areas. Table IV presents the same social characteristics controlling for major type of livestock produced.

Ninety (90) percent of the producers interviewed were male and there was no variation from this finding for each of the geographical areas. However, there was substantial variation of sex of respondent by type of livestock produced. Female respondents represented only five percent of the cattle producers and there were no females among the poultry producers. On the other hand, twenty-one percent of the swine producers were female and forty-three percent of the sheep/goat producers were female. Using a chi-square test, the level of significance was .003.

Ninety-two percent of the total sample reported that they were married. While the variation is not significant, a slightly higher proportion of the Coastal respondents reported they were married than the Rupununi respondents. The only significant variation of this when controlling for type of livestock produced was for sheep/goat producers. Only seventy-one percent of this group was married.

There was substantial age variation for geographical area and type of livestock producer. For the total sample, the modal age category (38 percent) was 36-50 years of age. The oldest category (over 50 years of age) was a close second with thirty-six percent and only about one quarter (26 percent) of the respondents were in the 35 and under category. When geographical area

TABLE III*

SELECTED SOCIAL CHARACTERISTICS OF LIVESTOCK PRODUCERS BY GEOGRAPHICAL AREA

Characteristic	Rupununi (%)	Coast (%)	Total (%)	X^2/P
Sex of Producer (110)				
Male	90	90	90	.06
Female	10	10	10	NS
Marital Status (110)				
Married	88	94	92	.67
Non-married	12	6	8	NS
Age (104)				
35 and under	41	18	26	7.85
36-50	38	39	38	.02
51 and over	22	43	36	
Education (110)				
None	37	0	13	29.44
Primary	50	86	70	
Secondary & College	13	14	16	.001
Occupation (108)				
Farmer	85	88	87	.01
Non-farmer	15	12	13	NS
Ethnic Identity (110)				
East Indian	2	46	30	81.06
African	7	42	29	
Amerindian	78	0	29	.001
Other	12	12	12	

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE IV*

SELECTED SOCIAL CHARACTERISTICS OF LIVESTOCK PRODUCERS
BY TYPE OF LIVESTOCK PRODUCED

	Type of Producer				
	Cattle	Swine	Poultry	Sheep/Goats	X^2/P
Sex					
Male	95	79	100	57	13.86
Female	5	21	0	43	.003
Marital Status					
Married	92	95	100	71	5.06
Non-married	8	5	0	29	NS
Age (years)					
35 and under	33	0	30	29	9.91
36-50	35	47	40	43	NS
51 and over	32	53	30	29	
Education					
None	20	0	0	0	22.52
Primary	71	89	50	100	
Secondary	9	11	50	0	.001
Ethnic Identity					
East Indian	30	5	55	57	74.41
African	15	95	0	43	
Amerindian	44	0	0	0	.001
Other	11	0	45	0	
Occupation					
Farmer	89	84	80	86	.80
Non-farmer	11	16	20	14	NS

*Sample size varies due to non-responses and non-applicability of questions. Except where noted, reported figures are percentages.

controlled, the data indicated that the Rupununi sample was a much younger group than the Coastal sample. While forty-one percent of the Rupununi respondents were in the youngest category and only twenty-two percent in the oldest category, almost the reverse was true for the Coastal sample: Only eighteen percent of the Coastal producers were in the youngest group and forty-three percent were in the oldest category. The level of significance based on Chi-Square is .02.

Likewise, there was age variation by major type of livestock produced. Cattle producers were almost equally divided between the age groups. Poultry and sheep/goat producers were very similar with regard to age; about two-fifths of each group was in the 36-50 age category and the remainders were equally split. Swine producers were quite different from the other producers with regard to age. There were none in the youngest category and over half were in the above 50 category.

Seventy percent of the respondents indicated that their highest educational attainment was the primary school level, thirteen percent reported no formal education and sixteen percent said they had attended secondary school or college.

Controlling for geographical area and type of animals produced, resulted in substantial variation for level of education. The Rupununi producers had a lower educational attainment when compared to the Coastal producers. Thirty-seven percent of the producers in the Rupununi indicated that they had no formal education. No Coastal producers were in this category. Eighty-six percent of the Coastal sample were in the primary category, and each geographical area had a similar proportion (13 and 14 percent) in the highest educational category. The Chi-square test yielded a value that was significant at the .001 level.

East Indians (30 percent), Africans (29 percent), and Amerindians (29 percent)

were almost equally represented in the total sample. Twelve percent were in the "Other" category (European, Chinese, etc.). As would be expected, the two geographical areas differed radically with regard to ethnic identity. The Rupununi sample was primarily Amerindian; only two percent were in the "Other" category. On the Coast there were no Amerindian producers and there were slightly more East Indians (46 percent) than Africans (42 percent); twelve percent were in the "Other" category. The Chi-square value was significant at the .001 level.

There was significant variation in ethnic identity by producer type. The cattle producer sample was the only one with respondents from each of the ethnic groups In that livestock category Amerindians (44 percent) and East Indians (30 percent) had substantially larger numbers than the other ethnic groups. Swine producers were either East Indian (55 percent) or "Other" (45 percent). Sheep/goat producers were East Indian (57 percent) or African (43 percent).

There was very little variation for occupation. Eighty percent or more of each group were farmers.

Table V presents data on the economic level of producers. Over two-thirds (68 percent) of the total sample reported incomes below $4,000 (G$) and only nine percent had incomes above $5,000 (G$). The variation in income between geographical area was only slight.

Sheep/goat producers were the group with the lowest incomes and poultry producers had the highest; fifty-seven percent were in the over $5,000 (G$) class. Swine producers had substantially lower incomes than cattle producers with eighty-one percent in the lowest category compared with sixty-eight percent. The Chi-square for these data was significant at the .04 level.

TABLE V*

INCOME OF LIVESTOCK PRODUCERS BY GEOGRAPHICAL AREA, PRINCIPAL TYPE OF LIVESTOCK PRODUCED OCCUPATION AND ETHNIC IDENTITY

	Income			
	Below 2,000 (G$)	2,000 5,000 (G$)	Above 5,000 (G$)	X^2/P
Total Sample (92)	68	23	9	
Geographical Area				
Rupununi (39)	67	23	10	6.25
Coast (53)	70	23	8	.04
Type of Livestock Produced				
Cattle (65)	68	26	6	25.28
Swine (7)	81	19	0	
Poultry (16)	29	14	57	
Sheep/Goats (4)	100	0	0	.001
Occupation				
Farmer (78)	71	21	9	2.03
Non-Farmer (13)	54	38	8	NS
Ethnic Identity				
East Indian (24)	63	29	8	23.65
African (27)	78	19	4	
Amerindian (30)	73	27	0	.001
Other (11)	45	9	45	
Age				
35 and under	75	25	0	3.76
36-50	60	27	13	NS
51 and over	68	21	12	
Education				
None	93	7	0	
Primary	22	23	5	13.47
Secondary and above	36	36	27	.01

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

Occupational data indicated that farmers had lower incomes than non-farmer producers. Chi-square was not significant. Seventy-one percent of the farmers were in the lowest income class compared with only fifty-four percent of the non-farmers.

Controlling for ethnic identity yielded substantial variation in income. The ethnic group with the highest income was the "Other" category: forty-five percent had incomes over $5,000 (G$). Africans (78 percent) and Amerindians (73 percent) had the largest proportions in the lowest category.

The variation in income levels between the three age groups was not statistically significant. However, the youngest group had the lowest income level and the middle age group the highest.

There was a positive linear relationship between income and level of education. For the lowest education level 93 percent were in the low income group. Only 36 percent of the highest educational group were in this category. The Chi-square was significant at the .01 level.

Chief Agricultural Activity

Table VI present data which summarizes the principal agricultural activity of livestock producers. Two-thirds (67 percent) of the respondents were engaged in combined livestock and food crop operations. Only 27 percent of the respondents considered themselves livestock producers. These findings probably reflect the fact that the majority of producers are involved in subsistence agriculture and specialization is not yet feasible. This demonstrates a trend towards diversification, especially for those persons who consider themselves agricultural producers (farmers). Ninety-three (93) persons out of the one hundred seven responding or eighty-seven percent considered themselves

TABLE VI*

PRINCIPAL AGRICULTURAL ACTIVITY BY GEOGRAPHICAL AREA, AGE, EDUCATION, ETHNIC IDENTITY, OCCUPATION, INCOME AND PRINCIPAL TYPE OF LIVESTOCK PRODUCED

	Principal Agriculture Activity			
	Livestock	Food Crop	Both	X^2/P
Total Sample (112)	27	5	67	
Geographical Area				
Rupununi (42)	29	10	62	2.50
Coast (69)	26	3	70	NS
Age (years)				
35 and under (27)	26	11	63	2.35
36-50 (40)	30	3	68	
51 and over (36)	25	6	69	NS
Education				
No formal education (14)	14	7	79	7.50
Primary (77)	22	5	73	
Secondary and college (17)	53	6	41	.10
Ethnic Identity				
East Indian (33)	33	0	67	16.69
African (32)	25	0	75	
Amerindian (32)	16	9	75	.01
Other (12)	33	25	42	
Occupation				
Farmer (93)	24	5	71	2.57
Non-farmer (14)	43	7	50	.28
Income (G$)				
Less than 2,000 (62)	18	8	74	15.71
2000-5,000 (21)	24	0	76	
Over 5,000 (8)	75	13	13	.003
Most Important Livestock				
Cattle (73)	21	7	72	8.94
Swine (20)	30	0	70	
Poultry (11)	55	9	36	N.S.
Sheep/Goats (7)	43	0	57	

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Execpt where noted, reported figures are percentages.

as farmers. Diversification appears to be important to those persons without secondary and college level education.

While there was no important variation when age was controlled, important differences appeared when education categories were compared. While the differences were not statistically significant, the data nevertheless indicates that the higher the education levels, the most likely the respondent was to be involved primarily in the production of livestock.

The relationship for ethnic identity and principal livestock activity is significant. African and Amerindian respondents were more likely to report that crop and livestock production activities were of equal importance in generating income. Respondents in the East Indian and "Other" categories were more likely to indicate that some aspect of livestock production was their major agricultural activity.

While the difference was not significant, it is interesting to note that non-farmers were more likely to indicate that livestock production is the major activity when compared to farmers.

There was a statistically significant relationship between income and principal agricultural activity. The higher the income level, the more likely the respondent reported specialization in some livestock production enterprise. This further differentiates between subsistence agriculture (diversification) and specialization. The higher income levels are more likely to be engaged in commercialized agricultrue and therefore be better able to become specialized.

Although the differences were not statistically significant, when the data were controlled for type of livestock produced, it appeared that poultry and sheep and goat producers were more likely to respond that livestock production was their most important agricultural activity. Cattle producers were least likely to describe this as their most important agricultural activity.

Land Use Characteristics

Table VII presents data concerning land use patterns and tenure for livestock and poultry producers on the Coast. It is interesting to note that only one-half of the livestock and/or poultry producers actually owned or rented the land which they used.

This would indicate that some other legal or informal agreement is arranged with the owner or the government or that the producer uses this land illegally (i.e., grazing on areas of estates and along the right-of-way near the highway).

The percentage of those persons either owning or renting land was greatest for cattle (56 percent) and swine (70 percent) producers. The responses for poultry and sheep/goat producers were small in comparison to cattle and swine producers and valid inferences may not be justifiable. However, it is evident from traveling along the Coast that there are many sheep and goats grazing unoccupied lands.

Herd Characteristics

Several characteristics associated with cattle production are summarized in Table VIII. From these data it is evident that the Rupununi area contains the largest cattle population in Guyana. The largest herd, though based on gross estimates, is owned by the Rupununi Development Company (RDC), and is believed to represent 26,000 head. The average herd in the Rupununi consists of 40 head of cattle.

Since the cattle numbers in the Rupununi, especially those in the RDC, were uncertain estimates, special attention should be devoted to the numbers contained in the column headed "Rupununi minus RDC." These figures are believed to represent more accurate data by small producers since they would be in closer contact with their herds. Considering these producers, herd size is still larger

TABLE VII*

SELECTED CHARACTERISTICS OF LAND USE FOR COASTAL AREA
BY PRINCIPAL TYPE OF LIVESTOCK PRODUCED

	% Owning Land	% Renting Land	% Owning and/or Renting Land
Geographical Area			
Coast (70)	31	30	50
Type of Livestock			
Cattle (32)	22	44	56
Swine (20)	55	20	70
Poultry (11)	18	18	18
Sheep/Goats (7)	14	0	14

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE VIII*

SELECTED HERD CHARACTERISTICS FOR CATTLE PRODUCERS(1973)

Characteristic	Rupununi	Rupununi minus RDC**	Coast	Total
Total Number of Cattle (78)	30,846	4,846	1,688	32,534
Smallest Herd Size	10	10	8	8
Largest Herd Size	26,000	1,200	250	26,000
Median Herd Size	41	40	23	30
Total Number of Breeding Age Cows (78)	10,453	2,453	534	10,987
Smallest No. of Cows	4	4	3	3
Largest No. of Cows	8,000	600	120	8,000
Median No. of Cows	21	20	11	14
Total Number of Breeding Age Bulls (75)	581	181	20	601
Smallest No. of Bulls	0	0	0	0
Largest No. of Bulls	400	89	4	400
Median No. of Bulls	2	2	0	1
Total Number of Calves (69)	851	851	273	1,124
Smallest No. of Calves	1	1	2	1
Largest No. of Calves	198	198	55	198
Median No. of Ca;ves	13	13	6	6
Total Number of Unbred Heifers (69)	1,085	585	238	1,323
Smallest No. of Heifers	0	0	0	0
Largest No. of Heifers	500	157	60	500
Median No. of Heifers	6	6	4	5
Total Number of Steers (69)	6,414	414	44	6,458
Smallest No. of Steers	0	0	0	0
Largest No. of Steers	6,000	156	20	6,000
Median No. of Steers	4	4	0	0
% with Improved Stock 78)	45	45	53	49

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

** Rupununi Development Company.

than those which are developed along the Coast. The largest herd identified during the survey was 1,200 in the Rupununi (excluding the RDC) vs. 250 along the Coast. It would appear from these data that there is an optimum ratio of bulls to cows being 1:14 in the Rupununi and 1:27 along the Coast. As far as culling practices are concerned, the data would suggest that steers are culled heavily along the Coast. In the entire survey along the Coast only forty-four steers were estimated to be distributed among the 36 cattle producers interviewed.

Table IX presents data which compares herd size by geographical area and selected socio-economic characteristics. When these data are compared the differences between herd size are significantly different (P .02). Herd size along the Coast is more likely to be 20 or less whereas in the Rupununi herd size is most likely to be 100 or above. Differences are significant (P . 005) when income and herd size are compared. Producers with specialized herds of 100 or above were more likely to be in the upper income category while those in the lower income category are almost always in the lowest income category.

When the other data are compared differences are not significant. In comparing age and herd size, most of the producers in each category operate herds of between 21 and 99 head. All ethnic groups, except Africans followed this same trend and were therefore more likely to have herds of 21 to 99 cattle.

According to herd size there were no significant difference between occupational classification (farmers vs. non-farmers). On the other hand, when the number of unbred heifers is expressed as a ratio with the total number of cattle in both geographical areas, the ratios are similar. It is evident

TABLE IX

SIZE OF HERD BY GEOGRAPHICAL AREA AND
SELECTED SOCIO-ECONOMIC CHARACTERISTICS

	Size of Herd			
	20 or less	21-99	100+	X^2/P
Total	38	44	18	
Geographical Area				
Rupununi District	29	46	24	7.71
Coast	47	42	11	.02
Age				
35 and under	52	80	17	4.00
36-50	28	56	16	NS
51 and over	32	50	18	
Education				
None	29	64	7	4.83
Primary	44	40	16	NS
Secondary & College	14	57	29	
Income (G$)				
Less than 2,000	52	41	7	
2,000-5,000	11	67	22	21.64
over 5,000	0	25	75	.005
Ethnic				
East Indian	36	50	14	
African	58	33	8	4.24
Amerindian	31	47	22	NS
Other	30	40	30	
Occupation				
Farmer	37	44	19	.23
Non-farmer	38	50	13	NS

that most of the cattle producers are concerned with the improvement of their herds, since forty-nine percent of the producers indicated that they were utilizing improved stock. Improved stock would no doubt include imported stock and improved local stock.

Due to a lack of adequate records, there is no available means of evaluating the reproductive efficiency of cows in the herd, to include calving percentages, weaning percentages, percent of cows bred or the length of the breeding season.

Nutrition

Table X presents data concerning the use of supplemental feed and supplements by cattle producers. In general, very few supplements are utilized. The only supplements utilized in the Rupununi, in limited amounts are salt and minerals. Minerals are used to a greater extent in the Coastal areas; however, the number of producers using this practice would not be significant. Molasses and rice bran are utilized along the Coast due to the location near sugar estates and rice producers. Hay and green chop are also utilized due to the lack of adequate grazing areas. Animals are usually confined to small areas with these feeds being harvested and hand fed to them. The failure of producers to utilize supplemental feed and supplements is probably due to simple economics and based on productive and financial returns above the cost of such additions.

Table XI reports the percent of cattle producers using any type of feed supplements by geographical area. Only 15 percent of the cattle producers responding indicated that they used feed supplements.

Coastal producers were more likely to have feed supplements than Rupununi producers. This is associated with the availability and cost of feed supple-

TABLE X

PERCENT OF CATTLE PRODUCERS USING SELECTED FEED SUPPLEMENTS BY GEOGRAPHICAL AREA

Supplement	Geographical Area		
	Rupununi (42)	Coast (36)	Total (78)
Salt	5	0	3
Minerals	2	14	8
Green Chop	0	6	3
Hay	0	6	0
Rice Bran	0	6	3
Molasses	0	11	5
Other	0	6	3

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE XI*

PERCENT OF CATTLE PRODUCERS USING ONE OR MORE OF THE FEED SUPPLEMENTS BY GEOGRAPHICAL AREA, SELECTED SOCIO-ECONOMIC CHARACTERISTICS AND SIZE OF HERD

Characteristic	%	X^2/P
Total (78)	15	
Geographical Area		
Rupununi (42)	7	3.48
Coast (36)	25	.06
Age of Respondent		
35 and under (23)	9	1.26
36-50 (25)	20	
51 and over (22)	14	NS
Education		
None (14)	0	4.59
Primary (50)	20	
Secondary and College (11)	18	.10
Ethnic Identity		
East Indian (22)	32	
African (12)	8	
Amerindian (32)	3	.02
Other (10)	10	
Occupation		
Farmer (68)	12	2.03
Non-farmer (8)	38	NS
Income (G$)		
Less than 2,000 (44)	7	3.51
2,000-5,000 (18)	22	
Over 5,000 (4)	25	NS
Size of Herd (number of cattle)		
20 or less (29)	14	.01
21-99 (34)	15	
100+ (14)	14	NS

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

ments. Rupununi producers would not be likely to use these supplements due to the transportation cost associated with getting them from the Coast to this interior area of Guyana.

Controlling by age did not produce a significant difference with regards to supplement users. The younger producers were least likely to utilize supplements.

The data also indicates that the use of supplements varies with educational attainment. Respondents without any formal education did not use feed supplements. Approximately 20 percent of the respondents in the other two educational categories reported the use of food supplements.

There was substantial variation in the use of supplements when ethnicity was controlled. East Indians were most likely to use feed supplements. Approximately one-third of the East Indian respondents reported using supplements. Only three percent of the Amerindians utilized supplemental feeding.

Although the differences were not statistically significant, non-farmers were more likely to utilize feed supplements than farmers. There was no relationship between herd size and use of feed supplements.

Table XII summarizes the use of various feeds and supplements by swine, poultry and sheep/goat producers. In comparing the producers' use of the three feed sources, swine and poultry are the greatest users of commercial feeds and supplements. Sheep/goat producers rely almost entirely on pastures with very little use of commercial feeds and supplements.

Health Practices

Table XIII reports selected health practices of cattle producers. A majority of producers (64 percent) in both areas indicated that some type of health problem was noted within their herds. With regard to routine vaccination

TABLE XII*

SELECTED NUTRITIONAL PRACTICES OF SWINE, POULTRY AND SHEEP/GOAT PRODUCERS

Nutritional Practices	Type of Producer		
	Swine (24)	Poultry (11)	Sheep/Goats (17)
Pasture Animals	29	not applicable	94
Commercial Feeds	88	100	6
Additional Supplements	71	45	18

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE XIII

SELECTED HEALTH PRACTICES OF CATTLE PRODUCERS
BY GEOGRAPHICAL AREA

Health Practices	Rupununi (42)	Coast (36)	Total (78)
Drenching	24	58	40
Dipping	0	0	0
Spraying	5	25	14
Blackleg Vaccination	0	0	0
Foot and Mouth Vaccination	48	0	26
Rabies Vaccination	43	19	32
Antibiotics Used	0	3	1
Footbaths	0	3	1
De-worming	21	56	37
Clamps Used for Castration	5	23	13
Health Problems Noted	64	51	58

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

programs, it appears that routine vaccination programs are used to the greatest extent in the Rupununi area when compared to the Coast. Of the producers interviewed in the Rupununi, forty-eight and forty-three percent utilize foot-and-mouth and rabies vaccines respectively. Rabies vaccine is utilized to a limited extent by producers along the Coast. Currently no foot-and-mouth problem is reported to exist along the Coast. Programs to control internal and external parasites are being utilized, however, drenching and possibly other methods of de-worming are used to a greater extent along the Coast.

Table XIV reports data on cattle producers which implement one or more of selected health practices. Foot and mouth vaccination was utilized in special case during the survey period. Data are therefore reported to include and exclude the use of the foot and mouth vaccine. Seventy-three percent of the respondents indicated that they utilized one or more of the selected health practices. However, when foot and mouth vaccination is excluded, the figure is 62 percent.

The difference between use of selected health practices between Coastal and Rupununi producers was not statistically significant. However, when foot and mouth vaccination is excluded, the Rupununi producers implemented a greater number of the selected health practices than Coastal producers.

When age is compared, analysis of the data indicates that the oldest age group is least likely to implement health practices. When foot and mouth vaccination is excluded, only 50 percent of this group of producers reported the use of any health practice. The middle age group reported the greatest use of the selected health practices.

The data indicate that there is a positive relationship between the use of health practices and education. Although the relationship was not statistically significant, the higher the income, the more likely producers were to implement

TABLE XIV*

PERCENT OF CATTLE PRODUCERS IMPLEMENTING ONE OR MORE OF THE SELECTED HEALTH PRACTICES (INCLUDING AND EXCLUDING FOOT AND MOUTH VACCINATION) BY GEOGRAPHICAL AREA, SELECTED SOCIO-ECONOMIC CHARACTERISTICS AND SIZE OF HERD

Characteristic	% Including Foot & Mouth Vaccination	X^2/P	% Including Foot & Mouth Vaccination	X^2/P
Total Sample (78)	73		62	
Geographical Area				
Rupununi (42)	76	.17	57	.78
Coast (36)	69	N.S.	69	N.S.
Age				
35 and under (23)	78	4.08	70	3.74
35-50 (25)	84	.13	76	N.S.
51 and over (22)	59		50	
Education				
None (14)	64	.77	43	2.78
Primary (50)	76	N.S.	66	N.S.
Secondary & College (11)	72		71	
Income (G$)				
Less than 2,000 (44)	64	2.67	52	5.36
2,000-5,000 (18)	89	N.S.	83	N.S.
Over 5,000 (4)	75		50	
Ethnic Identity				
East Indian (22)	82	5.28	82	6.74
African (12)	50	N.S.	50	N.S.
Amerindian (32)	78		59	
Other (10)	60		40	
Occupation				
Farmer (68)	71	1.85	62	.12
Non-farmer (8)	100	.67	75	N.S.
Size of Herd				
Less than 20 (29)	62	3.09	55	1.07
21-99 (34)	76	N.S.	67	N.S.
Over 100 (14)	86		64	

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

one or more of the reported health practices.

Differences between ethnic groups and their use of these health practices were also not significant. East Indians did, however, show a substantially higher incidence of implementing health practices than the other groups. Excluding foot and mouth vaccinations, 82 percent of the East Indian producers reported that they employed one or more health practices. The figure was 50 percent for Africans, 59 percent for Amerindians and 40 percent for "Others".

The selected health practices used in the production of swine, poultry and sheep/goats are presented in Table XV. It is apparent from the responses that all of the above producers noted various health problems. In response to these health problems, sheep/goat producers use primarily those methods for controlling parasites. Swine and poultry producers utilize where applicable measures for parasite control and vaccines and antibiotics to control diseases.

Record - Keeping

Table XVI provides data concerning record-keeping by cattle producers. The basic finding is that record-keeping is not very common. In the Rupununi area there are essentially no records kept, and even on the Coast there is very little record-keeping. Apparently there are very few producers who see any benefit in keeping complete records. Producers were most likely to keep records on breed type and births. Cattle producers are not actively involved in maintaining production records on their herds.

Table XVII reports the percent cattle producers implementing one or more record keeping activities. Only 12 percent of the respondents reported a record keeping activity. There was a significant difference in the incidence of record keeping when geographical areas were compared. Twenty-two percent of the Coastal producers reported some record keeping activity compared to only two percent for the Rupununi.

TABLE XV

SELECTED HEALTH ITEMS OF SWINE, POULTRY AND SHEEP/GOAT PRODUCERS

Health Item	Type of Producer		
	Swine (24)	Poultry (11)	Sheep/Goats (17)
Parasite Control	88	**	29
Vaccination	25	91	0
Antibiotics	**	100	**
Iron Injections	71	**	**
Health Problems Noted	75	100	71

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are precentages.

** Not applicable.

TABLE XVI

SELECTED ANIMAL RECORD-KEEPING ACTIVITY OF CATTLE PRODUCERS BY GEOGRAPHICAL AREA

Type of Record	Rupununi (42)	Coast (36)	Total (78)
Breed Type	2	6	4
Birth Date	2	14	8
Date First Bred	0	9	4
Number of Calf Births	0	17	6
Number of Calf Deaths	0	9	3
Cull Date	0	3	1
Reason for Culling	0	3	1
Gallons of Milk Produced (dairy cattle only 17)	0	6	6

* Sample size various due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE XVII*

PERCENT OF CATTLE PRODUCERS REPORTING THAT LIVESTOCK RECORDS WERE KEPT BY GEOGRAPHICAL AREA, SELECTED SOCIO-ECONOMIC CHARACTERISTICS AND SIZE OF HERD

Characteristic	%	X^2/P
Total Sample (78)		
Geographical Area		
Rupununi (42)	2	5.66
Coast (36)	22	.02
Age		
35 and under (23)	4	1.13
35-50 (25)	8	N.S.
51 and over (22)	9	
Education		
None (14)	0	2.26
Primary (50)	10	N.S.
Secondary & College (11)	0	
Income (G$)		
Less than 2,000 (44)	5	.23
2,000-5,000 (18)	6	N.S.
Over 5,000 (4)	0	
Ethnic Identity		
East Indian (22)	14	7.35
African (12)	25	.06
Amerindian (32)	0	
Other (10)	10	
Occupation		
Farmer (68)	9	.09
Non-farmer (8)	13	N.S.
Size of Herd		
Less than 20 (29)	17	2.36
21-99 (34	6	N.S.
Over 100 (14)	7	

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

There was also a significant difference between ethnic groups in implementing record keeping activities. Africans were most likely to engage in record keeping (25 percent).

Marketing Data

Table XVIII presents data which attempts to identify channels used to market cattle. In both geographical areas it is apparent that producers sell animals by the most competitive method in order to obtain the best price. Few cattle are sold to friends and neighbors. This would tend to indicate that livestock producers are developing confidence in the market system. Despite the previous statement, there are still persons who are not satisfied with the price received from the sale of their cattle. The disparity appears greatest for the producers marketing their animals in the Rupununi. Only thirty-seven percent of the Rupununi livestock producers responding were satisfied with the price which they received, compared to sixty-eight percent along the Coast. The most preferred way of selling cattle is on the hoof.

Marketing information for the other types of livestock producers is presented in Table XIX. Swine producers were most likely to sell their livestock to the Guyana Marketing Corporation (74 percent) and were least satisfied with the price received (30 percent were satisfied). Poultry producers marketed their products to wholesalers (66 percent). Over half of the sheep/goat producers sold their animals directly to neighbors and relatives; this group was most likely to be satisfied with the price received.

Extension Program

One of the major functions of this survey was to collect data concerning livestock producers' knowledge of, participation in and attitudes toward government programs designed to aid them. Findings for this section are

TABLE XVIII

SELECTED MARKETING CHARACTERISTICS OF CATTLE PRODUCERS BY GEOGRAPHICAL AREA

Characteristic	Rupununi	Coast	Total
Number of Producers Selling Cattle to:			
Abattoir	2	4	6
Meat Marketing Ltd.	9	3	12
Guyana Marketing Corp.	1	3	4
Cattle Dealer	7	4	11
Wholesale Butcher	0	15	15
Super Market	1	3	4
Other (neighbors, friends, etc)	7	3	4
Usually Sell Cattle: (66)			
On the Hoff	67	92	76
Carcus	17	4	12
Other	17	4	12
Form of Price Determination: (66)			
Per Head	24	75	42
Per lb. Live Weight	10	0	6
Per lb. Carcass Weight	67	25	52
Satisfied with Price (66)	37	68	42

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE XIX*

SELECTED MARKETING CHARACTERISTICS FOR SWINE, POULTRY AND SHEEP/GOAT PRODUCERS

	Swine (23)	Poultry/Eggs (11)	Sheep/Goats (11)
Usual Buyer			
Neighbors/Relatives	4	0	45
Wholesalers	0	66	0
Guyana Marketing Corp.	74	0	
Other	22	33	55
Satisfied with Price	30	36	82

* Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

presented in Tables XX - XXVI.

Livestock producers were asked if they were aware of the government extension program. For the total sample eighty-three percent of the respondents indicated their awareness of a program. The percentage was significantly higher for the Coast (91 percent) than the Rupununi (69 percent), and while all swine and poultry producers had knowledge of the program only seventy-seven percent of the cattle producers and seventy-one percent of the sheep/goat producers had knowledge. Producers in the 35-50 age category were more knowledgeable about the extension program than the other two age groups; the youngest group was least knowledgeable. East Indians (94 percent) had the most knowledge of extension knowledge and Amerindians (69 percent) had the least. There was not a significant variation by education, income or herd size.

Of those having knowledge of the program seventy-one percent had requested assistance. Coastal producers (76 percent) were more likely to have requested assistance than Rupununi producers and sheep/goat producers (100 percent) who knew about the problem were the type of livestock producers most likely to request assistance and cattle producers (55 percent) the least likely. This relationship was not statistically significant. The only variable that showed substantial variation was ethnic identity. Eighty-eight percent of the East Indians and "Others" were more likely than Africans (65 percent) and Amerindians (55 percent) to have requested assistance from the extension service.

Seventy-five percent of the producers requesting assistance received it. The only important variation to this over-all finding was that smaller proportions of sheep/goat (60 percent) and poultry (63 percent) producers were likely to have received the assistance.

Eighty-eight percent of the respondents receiving assistance reported that they were satisfied with the assistance received. Rupununi producers (77 percent)

TABLE XX*

RESPONSES TO SELECTED EXTENSION AND RELATED ITEMS
BY GEOGRAPHICAL AREA

	Rupununi %	Coast %	Total %	X^2	P
Knowledge of Extension Program (111)	69	91	83	7.61	N.S.
Requested Assistance from Extension Program (91)	62	76	71	7.22	N.S.
Received Assistance from Extension Service (65)	72	77	75	.002	N.S.
Satisfied with Assistance (49)	77	92	88	.80	N.S.
Extension Agent Visited Farm (108)	54	79	69	6.61	N.S.
Govt. Vets Vaccinate Animals (74)	74	22	51	17.59	N.S.
Attended Livestock Demonstration (109)	2	10	7	1.43	N.S.
Attended Livestock Seminar (108)	0	27	17	11.85	N.S.
Attended Field Day (108)	0	6	4	1.18	N.S.
Attended Field Tour (109)	0	4	3	.62	N.S.
Heard of Livestock Development Project (69)	51	64	57	.69	N.S.
Considered Getting Loan from LDP (39)	71	17	46	9.60	N.S.
Knowledge of Agricultural Bank (111)	45	80	67	12.45	N.S.
Tried to Get Loan from Agricultural Bank (74)	0	18	14	14.21	N.S.
Think Agricultural Cooperatives are Good (98)	86	84	85	0	N.S.
Interested in Participating in Agricultural Cooperative (100)	81	81	81	.05	N.S.

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE XXI*

RESPONSES TO SELECTED EXTENSION AND RELATED ITEMS
BY TYPE OF LIVESTOCK PRODUCER

	Cattle (72) %	Swine (24) %	Poultry (11) %	Sheep/Goats (17) %	X^2	P
Knowledge of Extension Program	77	100	100	71	9.01	.03
Requested Assistance from Extension Program	55	80	80	100	3.32	N.S.
Received Assistance from Extension Service	75	88	63	60	2.62	N.S.
Satisfied with Assistance	85	93	80	100	1.20	N.S.
Extension Agent Visited Farm	61	100	91	33	17.51	N.S.
Govt. Vets Vaccinate Animals	53	0	50	0		
Knowledge of Agricultural Bank	68	95	55	86	11.07	N.S.
Tried to Get Loan from Agricultural Bank	12	26	0	0	4.58	N.S.
Think Agricultural Cooperatives are Good	89	84	56	86	6.75	N.S.
Interested in Participating in Agricultural Cooperative	81	88	57	83	3.19	N.S.

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

TABLE XXII*

RESPONSES TO SELECTED EXTENSION AND RELATED ITEMS
BY SIZE OF HERD

	-20 or Less	21-99	100+	X^2	P
Knowledge of Extension Program (76)	71	82	79	1.06	N.S.
Requested Assistance from Extension Program (59)	62	71	60	.69	N.S.
Received Assistance from Extension Service (39)	69	90	33	8.04	.02
Satisfied with Assistance	100	78	100	**	
Extension Agent Visited Farm (74)	56	68	62	.93	N.S.
Govt. Vets Vaccinate Animals (72)	42	59	50	1.69	N.S.
Attended Livestock Demonstration (75)	85	94	86	**	
Attended Livestock Seminar (75)	81	97	93	**	
Attended Field Day (75)	93	100	93	**	
Attended Field Tour (75)	100	100	100	**	
Heard of Livestock Development (68)	45	58	69	1.95	N.S.
Considered Getting Loan from LDP (38)	40	37	67	2.32	N.S.
Knowledge of Agricultural Bank (76)	61	62	57	.08	N.S.
Tried to Get Loan from Agricultural Bank (46)	18	14	13	**	
Think Agricultural Cooperatives are Good (66)	96	81	100	**	
Interested in Participating in Agricultural Cooperative (57)	86	83	73	.96	N.S.

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

**Expected cell values are too small to compute X^2.

TABLE XXIII*

RESPONSES TO SELECTED EXTENSION AND RELATED ITEMS
BY AGE OF PRODUCER (Age in Years

	35 And Under	35-50	51 And Under	X^2	P
Knowledge of Extension Program (104)	70	93	84	5.77	.05
Requested Assistance from Extension Program (86)	68	75	68	.05	N.S.
Received Assistance from Extension Service (61)	77	78	71	.27	N.S.
Satisfied with Assistance (46)	100	90	80	**	**
Extension Agent Visited Farm (101)	52	80	67	5.64	.10
Govt. Vets Vaccinate Animals (68)	54	60	32	3.75	N.S.
Knowledge of Agricultural Bank (104)	56	70	73	2.37	N.S.
Tried to Get Loan from Agricultural Bank (70)	7	21	7	**	**
Think Agricultural Cooperatives are Good (89)	91	89	76	3.20	N.S.
Interested in Participating in Agricultural Cooperative	90	87	73	2.89	N.S.
Heard of Livestock Development Project (63)	52	58	61	.32	N.S.
Considered Seeking Loan from LDP (33)	45	57	36	1.09	N.S.

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

**Expected cell values are too small to compute X^2.

TABLE XXIV*

RESPONSES TO SELECTED EXTENSION AND RELATED ITEMS
BY EDUCATION OF PRODUCER

	None	Primary	Secondary & College	X^2	P
Knowledge of Extension Program (105)	71	85	77	1.64	N.S.
Requested Assistance from Extension Program (85)	70	70	78	.25	N.S.
Received Assistance from Extension Program (60)	86	80	57	2.20	N.S.
Satisfied with Assistance (47)	67	92	75	**	**
Extension Agent Visited Farm (102)	57	72	69	1.23	N.S.
Govt. Vets Vaccinate Animals (69)	71	46	57	**	**
Knowledge of Agricultural Bank (105)	29	72	62	9.78	.01
Tried to Get Loan from Agricultural Bank (68)	0	14	13	**	**
Think Agricultural Cooperatives are Good (92)	67	87	83	3.02	N.S.
Interested in Participating in Agricultural Cooperative (78)	67	88	73	3.57	N.S.
Heard of Livestock Development Project (64)	36	57	83	4.10	N.S.
Considered Seeking Loan from LDP (35)	40	36	80	3.31	N.S.

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

**Expected cell values are too small to compute X^2.

TABLE XXV*

RESPONSES TO SELECTED EXTENSION AND RELATED ITEMS
BY INCOME OF PRODUCER

	Less Than G$ 2,000	G$ 2,000-5,000	Over G$ 5,000	X^2	P
Knowledge of Extension Program (92)	78	86	88	.91	**
Requested Assistance from Extension Program (74)	70	65	71	.18	N.S.
Received Assistance from Extension Service (51)	77	91	60	2.05	**
Satisfied with Assistance (40)	89	90	33	**	**
Extension Agent Visited Farm (91)	66	76	38	3.86	N.S.
Govt. Vets Vaccinate Animals (75)	48	65	25	.07	**
Knowledge of Agricultural Bank (92)	62	76	75	1.74	**
Tried to Get Loan from Agricultural Bank (61)	8	19	0	**	**
Think Agricultural Cooperatives are Good (82)	82	89	57	3.47	**
Interested in Participating in Agricultural Cooperative (68)	85	81	33	8.64	.01
Heard of Livestock Development Project (64)	44	81	100	9.74	.01
Considered Seeking Loan from LDP (35)	33	46	100	**	**

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

**Expected cell values are too small to compute X^2.

TABLE XXVI*

RESPONSES TO SELECTED EXTENSION AND RELATED ITEMS
BY ETHNIC IDENTITY OF PRODUCER

	East Indian	African	Amerindian	Other	X^2	P
Knowledge of Extension Program (109)	94	81	69	92	7.92	.05
Requested Assistance from Extension Program (89)	83	65	55	83	6.00	N.S.
Received Assistance from Extension Service (63)	71	82	75	70	.83	N.S.
Satisfied with Assistance (47)	88	93	89	71	**	**
Extension Agent Visited Farm (106)	84	66	61	58	4.86	N.S.
Govt. Vets Vaccinate Animals (73)	33	9	81	33	23.19	.001
Knowledge of Agricultural Bank (109)	63	88	41	85	18.0	.001
Tried to Get Loan from Agricultural Bank (72)	20	14	0	9	**	**
Think Agricultural Cooperatives are Good (96)	76	90	93	70	5.26	N.S.
Interested in Participating in Agricultural Cooperative (82)	85	79	92	50	7.67	.05
Heard of Livestock Development Project (68)	74	50	39	80	8.62	N.S.
Considered Seeking Loan from LDP (38)	21	50	67	50	5.55	N.S.

*Sample size varies due to non-responses and non-applicability of questions. Sample size is contained in parentheses. Except where noted, reported figures are percentages.

**Expected cell values are too small to calculate X^2.

were less likely than those on the Coast (92 percent) to have been satisfied with the assistance. Comparing different types of livestock producers, sheep/goat (100 percent) and swine (93 percent) were most likely to be satisfied and poultry (80 percent) and cattle (85 percent) the least likely. When essentially all cattle producers with herds of 20 or less and 100 or more were satisfied with the extension service received, only 78 percent of these producers with herds of 21-99 were satisfied. The younger producers were more satisfied with services than were older producers.

Sixty-nine percent of the respondents reported that they had been visited by an extension agent. The rate was higher for the Coast (79 percent) than for the Rupununi (54 percent), swine (100 percent) and poultry (91 percent) producers were the most likely to be visited and sheep/goat producers the least likely. Respondents within the middle age group were more likely to have been visited than those in either of the other two groups. Only 38 percent of those with incomes greater than G$ 5,000-reported that they were visited by extension personnel, compared to 66 percent and 76% for the other groups.

A little over half (51 percent) of the respondents indicated that a government veterinarian had vaccinated their animals. The percentage is much higher for the Rupununi (74 percent) than the Coast (22 percent). The explanation for this finding is that the Ministry had just completed a campaign against foot-and-mouth disease in the Rupununi at the time of the survey and the government veterinarians had vaccinated all cattle that could be located in South Rupununi.

Rates of participation in extension activities— demonstrations, seminars, field days and field tours — were very low. Participation was particularly low in Rupununi. Fifty-three percent of the swine producers did report that

they had attended livestock seminars.

An important effort to develop the national cattle herd is being undertaken by the livestock Development Project. Fifty-seven percent of the cattle producers indicated that they had heard of the project. The rate was higher for the Coast (64 percent) than for the Rupununi (51 percent). An interesting finding is that of those who had heard of the project the Rupununi producers (71 percent) were much more likely to have considered obtaining a loan than the cattle producers on the Coast (17 percent). Although the relationship is not statistically significant the data indicates that producers with larger cattle herds were more knowledgeable of the livestock development project (LDP) and were also more interested in obtaining a LDP loan. The data also indicates that the higher the level of education, the more likely was the producer to know about the LDP. Controlling for ethnicity also yielded significant results. Producers in the "Other" category (80%) and East Indians (74%) were most likely to have heard of the LDP and Amerindians (39%) were least likely. An interesting finding is that while East Indians had a high level of awareness about the LDP, they were least likely to be interested in a LDP loan. Only 21 percent reported interest.

A standard source of funding for producers is the Agricultural Bank. Two-thirds (67 percent) of the total indicated knowledge of the bank. Once again, Coastal producers (80 percent) were most likely to know about it than Rupununi producers (45 percent). Swine producers (95 percent) were most likely to know about the Agricultural Bank and poultry producers (55 percent) the least likely. Of those with knowledge of the Bank only fourteen percent, all on the Coast, had tried to get a loan. Comparing different types of producers, only swine (26 percent) and cattle (12 percent) producers had attempted to get a loan from the Agricultural Bank. Respondents in the lowest educational category (29%)

were much less likely to know about the Agricultural Bank than were those in the other two educational groups. None of the respondents in the lowest educational group tried to get a loan. Amerindians were least likely to know about the Agriculturl Bank and none had tried to get a loan.

A final subject examined was the attitudes of livestock producers to cooperatives. This is important because Guyana is a cooperative republic and the government is attempting to encourage the development of cooperative efforts. Eighty-five percent of the total sample indicated that they felt that cooperatives are good. The only significant deviation from this was with poultry producers; only fifty-seven percent thought that cooperatives were good. Of those supporting cooperatives eighty-one percent said they were interested in participating in one. The only significant variation from this was for poultry producers; only fifty-seven percent said they were interested in participating in a cooperative.

Analysis of the data, while not statistically significant, indicates that producer support for cooperatives decreases with age. Support for cooperatives was highest for the youngest age group (90%). The respondent with no formal education was also less likely to approve of cooperatives.

While the results were not statistically significant, only 57 percent of the respondents in the higher income group approved of cooperatives; this compares with 82 percent for the other two groups. Income groups did differ significantly with regards to interest in joining producer cooperatives. Only 33 percent of the high income group expressed an interest; this compares to 85 percent for the lowest income group and 81 percent for the middle income group.

Ethnic groups differed in their approval of the African and Amerindian producers voiced approval of cooperatives. Only 76 percent of the "Other"

producers responding indicated approval. The difference between groups was significant with regards to producer willingness to join cooperatives.

211-d Livestock Project

CARVER RESEARCH FOUNDATION OF TUSKEGEE INSTITUTE
Tuskegee Institute, Alabama 36088
U.S.A.

In Cooperation With

THE GUYANA MINISTRY OF AGRICULTURE AND NATIONAL DEVELOPMENT AND THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

SURVEY OF LIVESTOCK PRODUCERS

Hello! I'm _____. We are cooperating with the Ministry of Agriculture and National Development in conducting a survey to find out how the extension program might be of greater service to livestock producers in Guyana. You were selected in the sample to be included in this survey.

I would like to ask you some questions about your land, your herd, Government extension programs and related matters. The interview should take about one-half hour of your time.

The information which you supply will be treated confidentially. Your comments will be combined with those of other persons and used only for statistical purposes.

Respondent's Name _____

Respondent's Location _____

_____

Interview: Date _____, 1974

Time Started _____

Time Completed _____

Interview's Name _____

FOR OFFICE USE ONLY

Study No. ---- 790

ID ___ ___ ___

District _____

Sample area _____

Supervisor's Name _____

SURVEY OF LIVESTOCK PRODUCERS

A. Which of the following types of livestock do you have?

1. Dairy or Beef Cattle? Yes _____, No _____

   (a) If yes, How Many? _____

   (If five head or more ask dairy or beef questions).

2. Poultry? Yes _____, No _____

   (a) If yes, How Many? _____

   (If flock if 1,000 or more, ask poultry questions)

3. Swine? Yes _____, No _____

   (a) If yes, How Many? _____

   (If five or more sows, ask swine questions).

4. Sheep and goats? Yes _____ No _____

   (a) If yes, How Many? _____

   (If ten or more, ask sheep and goat questions).

If RESPONDENT DOES NOT QUALIFY AS A LIVESTOCK PRODUCER IN ANY OF THE CATEGORIES, INDICATE THIS TO THE RESPONDENT AND THANK HIM FOR HIS COOPERATION.

B. Questions Concerning Land Use

1. How many acres of land do you own? _____. Cost per acre? $_____

   How long have you owned this land? _____ years.

2. How many acres of land do you rent or lease? _____

   (a) Tenure of lease (years) _____

   (b) Annual amount of rent $/acre _____.

3. Regarding your agricultural activities, how do you classify yourself?

   Livestock producer _____; Food crop farmer _____; Both _____.

   Other _____.

4. Commercially, which type of livestock is most important to you?

Beef cattle _____; Dairy cattle _____; Swine _____;

Poultry _____; Sheep and goats _____

C. Herd Characteristics: Management and Marketing Practices

1. Beef and Dairy Cattle

I would like to ask several questions about cattle number and performance.

Type	No. on Hand	Age	Average Weight	No. Died in Past Year	Number Sold (1973)	Value	Number Stolen in Past Year
Breeding Bulls							
Brood Cows							
Unbred Heifers Over 2 yrs. old							
Calves Less than 1 yr.							
Calves 1-2 yrs. old							
Steers (2-3 yrs. old)							
Steers (3-4 yrs. old)							
Steers (4-5 yrs. old)							
Steers (5-6 yrs. old)							
Steers (6 & over)							

What breeds of beef and dairy cattle do you have?

2. Breeding Program.

(a) What method do you use? A.I. _____; Natural _____; Both_____.

(b) Cost of A. I. _____

(c) How many cows did you have in 1973, at least 3 years of age? _____.

(d) How many cows failed to produce a calf in 1973? _____.

(e) How many calves were born in 1973? Live births _____ Dead _____.

(f) At what age do heifers usually breed the first time? _____ years.

(g) How many calves died in 1973? _____

(h) How many cows aborted in 1973? _____

3. Dairy Herd.

(a) Do you use milking machines? _____yes; _____No.

(b) Do you usually wash the udder before milking? yes _____; No_____.

(c) How many cows are you currently milking? _____

(d) Is your herd primarily dairy _____; Beef _____; or both_____.

4. Information on Cattle feeding.

(a) How many acres of pasture do your cattle use? _____ Native _____ and improved _____.

(b) Pasture use

	Acres	Proportion fed to Cattle (%)	Yields	Fertilizer - lbs. / acre and analysis or lbs. n, P, or K per acre
Pasture				
Other (Specify, i.e. hay, green chop, etc.)				

(c) How much supplemental feeding do you use?

SUPPLEMENT	No. of Months fed per year	Types of Animals Receiving feed	lbs. / day per head	Cost/ lb.	Where Purchased
Salt					
Minerals					
Mixed feeds					
Protein Supplement					
Green Chop					
Hay					
Corn					
Bone Meal					
Rice Bran					
Wheat Middlings					
Urea					
Molasses					
Copra Meal					
Others (Specify)					

5. Herd Health

(a) Which of the following animal health practices are used?

Practice		Frequency	Cost per head/ Treatment	or Total COST	Number Treated
Drenching		_____	_____	_____	_____
Dipping		_____	_____	_____	_____
Spraying		_____	_____	_____	_____
Vaccinate:	Anthrax	_____	_____	_____	_____
	Blackleg	_____	_____	_____	_____
	Leptospirosis	_____	_____	_____	_____
	Brucellosis	_____	_____	_____	_____
	Foot & Mouth	_____	_____	_____	_____
	Rabies	_____	_____	_____	_____
	(Other	_____	_____	_____	_____
Antibiotics Used	_____	_____	_____	_____	_____
_____		_____	_____	_____	_____
Foot Baths (control foot rot		_____	_____	_____	_____
Worming (specify method)		_____	_____	_____	_____

(b) What method of castration do you use: _____
(If males are not castrated, enter None)

(c) What health problems do your cattle have? _____

_____

6. Marketing Dairy Products

(a) How many gallons of milk produced daily? _____

(b) To whom do you usually sell your milk? What price do you receive?

Buyer	Price Received	Percent Sold to	Proportion of Total Sales
_____ Processing Plant	_____	_____	_____
_____ Collecting Station	_____	_____	_____
_____ Neighbors & Relatives	_____	_____	_____
_____ Local Market	_____	_____	_____
_____ Other	_____	_____	_____

(c) How many gallons are sold daily? _____

(d) Are you satisfied with the price? Yes _____ No _____

7. Marketing Beef Cattle

(a) Do you usually sell your beef - on the hoof _____, carcass, _____, or both _____?

(b) On what basis do you sell live cattle? Per head _____. Per pound _____ live weight _____, or per pound carcass weight _____.

(c) Number of live cattle sold to: Abbattoir _____; Meat Marketing Ltd. _____; Guyana Marketing Corp. ____; Cattle dealer _____; wholesale Butcher _____; Meat Market ____; Supermarket _____; or Other (specify) _____;

(d) Where do you sell your carcass beef? _____

(e) To whom do you sell carcass beef? _____

(f) What price are you paid for culled cows _____; steers _____; calves _____; and breeding bulls _____?

(g) Is the price satisfactory? Yes _____ No _____

D. For which of the following do you keep records? Breed ____; birth date ____; date first breed ____; calf brrths _____; calf deaths _____; abortions _____; cull date _____; reasons for culling _____; gallons of milk produced _____.

E. The following set of questions relate to the availability of and requirements for labor on your farm.

1. Have you had any difficulty getting hired farm labor? Yes ____ No ____

2. Total farm labor required per year (full-time men) _____?

3. Percent of farm labor use for livestock production _____%.

4. Percent of livestock labor used for the following jobs:

   (a) Pasture maintenance _____%

   (b) Cattle handling _____%

   (c) Milking labor _____%

5. How much labor would be required to establish one acre of improved pasture? _____(hours)

   IF LABOR IS HIRED, ANSWER 6, 7, and 8:

6. Wage rates paid cattle handlers _____

7. Wage rate for farm labor _____

8. Wage rate for milking crew laborers _____

F. The following questions are pertinent only if improved pasture is used in producing cattle.

1. What kind of grass is used for improved pasture? _____

2. What kind of legume is used for improved pasture? _____

3. Cost and amount of fertilizer (dollars per acre) $ _____

4. Costs ($/acre) of pasture establishment $_____

G. Other costs and requirements associated with livestock production:

1. Cost of fence construction ($/mile) $_____

2. Hours of labor required to construct a mile of fence _____

8. Swine

A. I have a few questions about your swine operation. First of all, I would like to know the number, ages and approximate weights of the boars, sows, and pigs.

(1)

	Number	Ages	Weights
Boars			
Sows			
Pigs			

(2) What type of operation do you have? _____ feeder pig

_____ farrowing _____ finishing ____ Mixed

B. Questions about breeding.

(1) What breeds do you have? _____

(2) At what age do you usually breed gilts? _____

(3) Do you usually do a semen evaluation before you use a bore for breeding purposes? ____ yes ____ no

(4) What method of farrowing do you use? _____ crates _____ pens

____ pasture

(5) Are you usually with the sow during delivery? ____yes ___ no

C. Questions about feeding.

(1) Do you pasture your swine? ____ yes ____ no

(2) Do you use commercial feeds? ____ yes ____ NO

(3) What supplements do you feed your swine? _____

D. Health questions.

(1) Do you spray your swine for parasites? ____ yes ____ no

(2) Do you vaccinate? ____ yes; for what? _____ _____ no

(3) Do you give your pigs iron injections? _____ yes _____ no

(4) What health problems do you have with your swine? _____

_____

F. Questions about marketing.

(1) About how many swine did you sell in 1973? _____

(2) Were they sold on the hoof or as carcus pork?

____Hoof _____ Carcus _____ Both

(3) What price did you receive _____

(4) Were you satisfied with the price? _____ yes ____ no

(5) To whom did you sell the swine _____ abattoir _____ neighbors and/or relatives _____ market _____ other _____

9. Poultry

A. Questions about the characteristics of your poultry.

(1) How many layers do you have? _____

(2) How many broilers do you have? _____

(3) What breeds do you have? _____

(4) Where do you get your chicks? _____ hatchery _____ produced on farm _____ Other _____

(5) How would you characterize your operations? _____ broiler _____ layer _____ broiler/layer

B. Questions about feeding.

(1) Do you use commercial feed? _____ yes ____ no

(2) (If yes) Is it a complete feed or a supplement?

_____ complete _____ supplement

(3) What supplements do you use in your feed? _____

(4) Do you use artificial light? ____ yes _____no

If yes is light automatically controlled _____ yes _____ no

(5) Do you have a cage or floor operation? _____ cage _____ floor _____ both

C. A few health related questions.

(1) Do you vaccinate your birds? ____ yes _____ no

(2) Do you feed your birds antibiotics? _____ yes _____ no

(3) What health problems have you noticed in your flock?

_____

D. (If layer operation) Now a few questions about the marketing of your eggs.

(1) About how many eggs do you collect daily? _____

(2) About how many eggs do you sell daily? _____

(3) To whom do you sell most of your eggs? _____ Neighbors and/or relatives _____Wholesaler ___ Market _____ Other _____

(4) What price do you get for your eggs? What is the average price per dozen? _____

(5) Are you satisfied with the price? _____ yes ____ no

(6) Do you candle eggs? _____ yes ____ no

F. (If broilers) I have some questions about how you sell your broilers.

(1) About how many birds do you sell daily? _____

(2) Do you sell them live or dressed? _____ live _____dressed _____ both

(3) To whom do you sell them? _____ Neighbors and/or relatives market _____ Other _____

(4) What price do you get for your chickens? live _____ dressed _____

(5) Are you satisfied with the price you receive? _____ yes _____ no

10. Sheep and Goats

A. How many sheep and goats do you have? Sheep _____ Goats _____

B. I would like to get some information about how you feed your sheep and goats.

(1) Do you pasture your sheep and goats? ____ yes _____ no

(2) Do you feed them commercial feed? ____ yes _____no

(3) What supplement do you feed them? _____

C. I would like to ask you some questions about herd health.

(1) What procedures do you use to control parasites among your sheep and goats? _____

(2) Do you vaccinate your sheep and goats? _____

(3) What other health practices do you follow with your sheep and goats? _____

(4) What health problems do you have with your sheep and goats?

_____

D. I would like to ask you some questions about how you market your sheep and goats.

(1) How many sheep and goats did you sell in 1973?

_____ Sheep _____Goats

(2) Did you sell the animals on the hoof or as carcus?

_____ Hoof _____ Carcus _____Both

(3) To whom did you sell the animals? Neighbors and/or relatives

____ Market _____ abattoir _____other _____

(4) What price do you usually get for your animals?

_____ Goats Sheep _____

(5) Are you satisfied with the price? _____ yes _____ no

11. Now I have a few questions about government programs for livestock producers.

A. Did you know that the government has a program designed to provide technical assistance, information and advice to livestock producers?

____ yes _____ no

B. (If yes) Where did you learn about the extension program?

_____

C. (1) Have you ever requested technical assistance or information from the extension service? _____ yes ____ no

(2) (If yes) Did you receive the assistance requested? _____ yes _____ no

(3) (If yes) Were you satisfied with the assistance received? _____ yes _____ no

(4) (If never requested assistance) Why haven't you requested technical assistance from the government? _____

_____

D. (1) Has an extension agen ever visited your farm? _____Yes _____ no

(2) (If yes) How many times in the last five years? _____(ca.)

E. What sorts of information, services or assistance would you find useful for your livestock operation? _____

_____

F. (Cattle producers) Do the government vets vaccinate your cattle? _____yes ____ no

(2) Are there any problems associated with this service? yes; what? _____ ____ no

G. (1) (If dairy) Did you know that the government has an A.I. breeding program? _____ yes _____ no

(2) Have you ever used this service? Yes ____ No; why not? _____

_____

H. (1) (Beef Producers) Have you heard of the Livestock (beef) Development Project, a program which provides loans for the development of beef cattle operations? _____ yes _____ no

(2) (If yes) Have you ever considered seeking one of those loans? _____ yes ____ no

(3) (If heard of LDP) Why or why not? _____

_____

12. One final set of questions. They have to do with background characteristics

of livestock producers, things such as family characteristics, age, etc.

A. Sex of producer (DONOT ASK) ____ male _____ female

B. Are you married? _____ yes ____ no

C. (If married) How many children do you have? _____

D. How old are you? _____ years

E. How far did you go in school? _____

F. What is your major occupation? _____

G. Income

1. What was your 1973 income? _____ dollars

2. How much of your 1973 income was due to livestock? _____ dollars

3. How much of your 1973 income was due to agriculture? _____ dollars

H. Ethnic identity (ASK ONLY IF NECESSARY) _____ East Indian

_____ African _____ Chinese _____ Protuguese _____ Other Europeans

_____ Amerindians _____ Mixed _____ Other _____