ASSESSMENT OF THE FOOD, NUTRITION AND HEALTH SITUATION OF BELIZE

THE GOVERNMENT OF BELIZE
MINISTRY OF HEALTH

in collaboration with

MINISTRIES OF AGRICULTURE AND FISHERIES
SOCIAL DEVELOPMENT
CENTRAL STATISTICAL OFFICE OF THE MINISTRY OF FINANCE
AND THE
MINISTRY OF EDUCATION

with the assistance from

PAN AMERICAN HEALTH ORGANIZATION (PAHO/WHO),
INSTITUTE OF NUTRITION OF CENTRAL AMERICA AND PANAMA (INCAP)
AND
CARIBBEAN FOOD AND NUTRITION INSTITUTE (CFNI)

BELIZE, NOVEMBER, 1992

INCAP Publication DCI/002

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PREFACE

The Government of Belize, with support from INCAP, PAHO/WHO and CFNI, carried out an assessment of the food and nutrition situation in the country based on existing data The effort was carried out with an intersectoral approach, as it was elaborated by a team of technical personnel representing the Ministries of Health, Agriculture, Finance and Social Services

Based on a hypothetical causal model developed by the team, which fundamentally identifies and displays the interrelationship of those factors that are important determinants of the nutritional situation in Belize, it was agreed that the nutritional situation depends on two major elements the **biological utilization** of foods by individuals and the actual **food intake**

Biological utilization is related to the health status, which in part is determined by the supply and demand of health services and environmental conditions, including potable water and waste disposal Food intake, on the other hand, depends on the acquisition of food, which is a direct result of complex factors such as food availability, purchasing power and food prices and income which in turn are determined by marketing and production practices and level of employment Cultural patterns and level of education influence both the health related conditions and food acquisition aspects

On compiling the health related data, several gaps were identified in the information system and frank discrepancies were identified between official figures for some indicators and specific investigations Infant mortality has shown a decreasing trend in the past few decades, although recent specific reviews indicate that the actual value is being grossly underestimated The same situation occurs with maternal mortality, another important indicator The strengthening and improvement of the medical information system is considered essential

Particular nutritional problems have been identified through various studies Undernutrition affects 25 4% of clinic attending children under five-years-of-age by the weight-for-age indicator, and overnutrition affects 15 4% Data by district shows Toledo with the highest prevalence of malnourished children and Belize the highest for overnourished infants The exact extent of the malnutrition problem should be studied by means of a weight height survey in Toledo, and effective educational campaigns supported by policy development should be promoted, so that basic nutritional practices including breastfeeding and weaning are improved

Kekchi, East Indian and Garifuna children are affected by vitamin A and zinc deficiency, while iron, another micronutrient of nutritional importance, is deficient in approximately 40% of all pregnant women despite a high prenatal coverage and an iron folate supplementation programme, which needs to be evaluated These problems deserve special attention, and long-term interventions such as food fortification, should be considered

Medical statistics indicate that chronic non-communicable diseases such as heart and hypertensive diseases, endocrine disorders, cerebrovascular disease and malignant neoplasms have consistently represented the main causes of hospitalization and they account for almost one third of all deaths, while in 1976 these were only 18% This increase may be related to the fact that the apparent increase in food availability in the past decades has been largely at the expense of simple sugar, food from animals, fats and oils largely derived from animal sources, thus increasing the consumption of saturated fats which have been strongly associated to chronic diseases

Programmes focused on the preventive and curative measures addressing these problems should be developed and strengthened and targeted at different groups including school aged, young adult, adult and elderly population It is essential to strengthen the nutritional unit with trained staff, appropriate infrastructure and reasonable budgetary allocation, in order to develop an effective machinery for the purpose of planning and evaluation of nutritional programmes

The coverage of water and sanitation facilities need to be improved, particularly in the Toledo and Stann Creek Districts

Food intake is influenced by food acquisition, family size and cultural patterns, while food acquisition is determined by food availability, food prices and purchasing power The quantity and quality of imported food items and locally grown crops are based mainly on socioeconomic considerations and have little, if any, direct relationship to nutrition and health implications Food production at the subsistence level is responsible for feeding a large segment of the population, especially in the rural areas where wages tend to be lower and ethnic diets persist "Food from animals" is the largest food group in national food availability which implies that Belizeans are heavy consumers of animal products Districts that produce the most foods also demonstrated a high availability to consumers The marketing and distribution system for locally grown food products is highly inefficient as compared to that for imported food items

The proper implementation of a fully integrated plan should make nutritious foods readily available to educated consumers at affordable prices for good nutrition and health, while simultaneously providing a fair return to farmers on their investments to allow for improved standards of living This long term food and nutrition plan should be supported by short term initiatives such as the establishment of a food basket and minimum nutrient requirements, increasing the supply of locally grown nutritious food items, creating adjustments in the trade and marketing environment, launching of food and nutrition education programmes, and promotion of activities in the area of income generating projects particularly those in agro-processing

Another important determinant in food intake is education As an intervention, its effects are obtained in the long-term, therefore, the integration of food and nutrition at an early age is essential and probably the best strategy to reap the benefits of good food and nutritional habits of a population In Belize, the percentage of primary school enrollments is much higher than for higher education, which makes it an appropriate channel for interventions However, the Belize Education Policy needs to address this topic as a major component of the primary school curriculum and the possibility of including food and nutrition as an examinable subject in the National Selection Examination should be considered, since the emphasis of primary school education seems to be on examinable subjects

Considering the multiple sectors and factors that determine the nutritional situation of a population, an important general recommendation of this assessment is to have a multisectoral food and nutrition task force appointed to develop a National Food and Nutrition Plan for Belize and to monitor the implementation of planned activities The plan should emphasize on an integrated approach at both rural and urban levels A Secretariat should be established within a designated ministry to coordinate and support the activities of this task force

It is the hope of the assessment team that this attempt to provide a global description of the food and nutrition situation will be a useful tool for both the political and technical levels, as they continue to strive and plan for more comprehensive and coherent strategies and programmes responding to the needs of the Belizean people

FOREWORD

The best decisions and actions that planners and policy-makers can undertake to improve a situation are those that are based on the clear and precise knowledge of the existing conditions This is particularly true for the formulation of policies and the choice of appropriate actions to improve the food and nutrition situation of a country

The Government of Belize with support from INCAP, PAHO/WHO and CFNI has carried out the present "Assessment of the Food and Nutrition Situation" based on the revision of existing data It has featured the valuable input of a technical team representing the health, agriculture, social development and education sectors, hereby addressing to a large extent the intersectoriality of the food and nutrition problem

Initially, the team worked on the development of a causal model which basically identified and displayed the interrelationship of those factors within the Belizean context that the team considered to be important determinants of the nutritional situation

Data to support each factor identified in the hypothetical causal model was gathered from a series of existing sources and its analysis is presented in this final and comprehensive document

We trust that this attempt to provide a global description of the food and nutrition situation will be a useful tool for both the political and technical levels as they continue to strive and plan for more comprehensive and coherent strategies and programmes that respond to the needs of the Belizean people

ACKNOWLEDGEMENTS

The Belize Food and Nutrition Assessment was co-sponsored by the Institute of Nutrition of Central America and Panama (INCAP) and the Pan American Health Organization (PAHO) Additional support was provided by the Caribbean Food and Nutrition Institute (CFNI)

Special acknowledgements to Dr Theodore Aranda, Minister of Health for his interest and genuine concern in the food and nutritional problems of Belize and his support and collaboration in liaising with Ministers of other sectors which facilitated the Assessment process

This Assessment was made possible through the commitment and dedication of the task force that represented primarily those governmental sectors directly impacting on the food and nutrition situation of the country These persons are Mr Wendel Parham and Mr Phillip Tate from the Ministry of Agriculture and Fisheries, Miss Anita Zetina, Ministry of Social Development, Mrs Maria Magaña, Ministry of Education, Miss Dorla McKenzie and Miss Gilda Dennison from the Ministry of Health, Mr Dudley Augustine from the School of Continuing Studies, University of the West Indies, and Mr Martin Aldana and Mr David Garcia from the Central Statistical Office of the Ministry of Finance

A special thanks to Dr Ramon Figueroa, Director of Maternal and Child Health Programme for his time and efforts in coordinating the activities of the Assessment

Special acknowledgements to Dr Yma Alfaro and Dr Lilian Ninette Reneau for the valuable assistance and guidance throughout the entire process of the Assessment

The collaboration and efforts of Dr A W Patterson and Dr Dinesh Sinha from CFNI is deeply appreciated Finally, a sincere thanks to Dr Rafael Flores and INCAP for the continuous assistance Belize has received from the initial concept and subsequent plans for a National Nutrition Survey in 1988, to the final stages of editing and publishing the final report of the Belize Food and Nutrition Assessment in 1993

I. INTRODUCTION

The nutritional well-being of a nation requires that decision-makers integrate health, education and food policies for the population

The present Assessment of the Food and Nutrition Situation of Belize is a preliminary step in the process of planning a National Food and Nutrition Policy

In the early part of 1992, the Institute of Nutrition of Central America and Panama (INCAP), in its continued effort to fully support the diagnosis of the food and nutrition situation of the Country, assisted the Ministry of Health in the development of a proposal which was thereafter approved by officials of the Ministry of Health Added to this approval was the full support of the Ministers of other sectors, acknowledging the indisputable need to evaluate and obtain precise and pertinent information on the food and nutrition situation, that will thereafter facilitate the development of policies and the choice of appropriate interventions and actions aimed at improving such a complex condition as the nutritional status of the people

The Assessment basically followed the guidelines described by Ivan Beghin in his "Guide to Nutritional Assessment", and features the formation of a multisectoral team (1)

The document, hereby presented is the result of the team work of a multisectoral technical group who attempted to provide, through existing information, a comprehensive review of issues and recommendations that will generate actions leading to a coherent and integrated food and nutrition strategy to improve the nutritional situation and thus the well-being of the Belizean population

II. BACKGROUND

Several activities throughout the past 15 years have been carried out in Belize in attempts to improve the food and nutrition situation

Belize became a member of the Caribbean Food and Nutrition Institute (CFNI) in the 1970's In 1976, the Government invited the CFNI to carry out a preliminary review of the food and nutrition situation of the country A document, "An Assessment of the Food and Nutrition Situation in Belize" was prepared and presented to the Government (2) In 1977, CFNI and the Government of Belize cooperated in producing the document "Identification of the Food and Nutrition Problems of Belize" (3) This document, along with the earlier study, functionally describe the nutrition problem of Belize and was the basis for the development of a food and nutrition policy of the country

In 1978, the Government requested CFNI to collaborate in the development of a "Food and Nutrition Policy" for the country (4)

The issues identified at that time were the following

1 Energy-protein malnutrition among infants and young children

2 Anaemia reported (but not confirmed statistically) as a major condition affecting young children and pregnant women

3 There was an apparently poor environment in particular areas of Belize Available data coincided with accounts of intestinal parasite problems in poorly serviced areas Evidently, there was a need for safer water supplies, adequate garbage and sewage disposal

4 The household dietary intake of energy and nutrients was less in low income parts of the country and where farmland was limited

5 While data was scarce, there was a strong likelihood that supplementary feeding was introduced to many infants in rural areas too late and in inadequate quantity to ensure adequate growth of young children

6 Infants were sometimes given supplementary feedings in place of (or in addition to) breast milk too early and too diluted, and often in inadequate hygienic conditions causing inadequate growth and introducing infectious diseases

7 Low-income families who relied on food purchase for the greater part of their diet were at particular risk, should prices increase or jobs become unavailable

8 Lastly, a major problem was related to an insufficient database that would enable the identification of factors that need to be taken into consideration to improve the nutritional status of the population of Belize

The Policy document proposed the establishment of a National Nutrition Council (NNC) by Act of Parliament The Council was to be multidisciplinary and multisectoral in nature The NNC would be responsible to report regularly the progress of the Food and Nutrition Planning to the Cabinet

In 1982/83, "The Belize National Food and Nutrition Assessment" (5) was jointly conducted by CARE, the Government of Belize, Teachers College and Columbia University This assessment analyzed the nutrient intake and food habits of selected rural schoolchildren

Unfortunately, there was poor follow-up In 1984, the issue of the food and nutrition situation in the country was again retaken and an extensive analysis was presented by Sandra Farnum (9) This analysis pointed out the existence of data gaps in the health and nutrition information, including intra-household distribution of nutrients

The recommendations for action were mainly to

1 Establish a Nutrition Unit within the Ministry of Health

2 Revitalize the National Nutrition Council

3 Establish a Food and Nutrition Surveillance System

4 Improve the water supply and sewage disposal systems

5 Increase the number of health personnel and the diagnostic capabilities of doctors and nurses

6 Improve the immunization coverage in the country

By 1987, the Maternal and Child Health Department of the Ministry of Health became more concerned about the various striking problems related to nutrition, specifically those related to breastfeeding and weaning practices, as well as under and over nutrition in young and old However, the actions to be taken required an updated nutritional assessment of the country

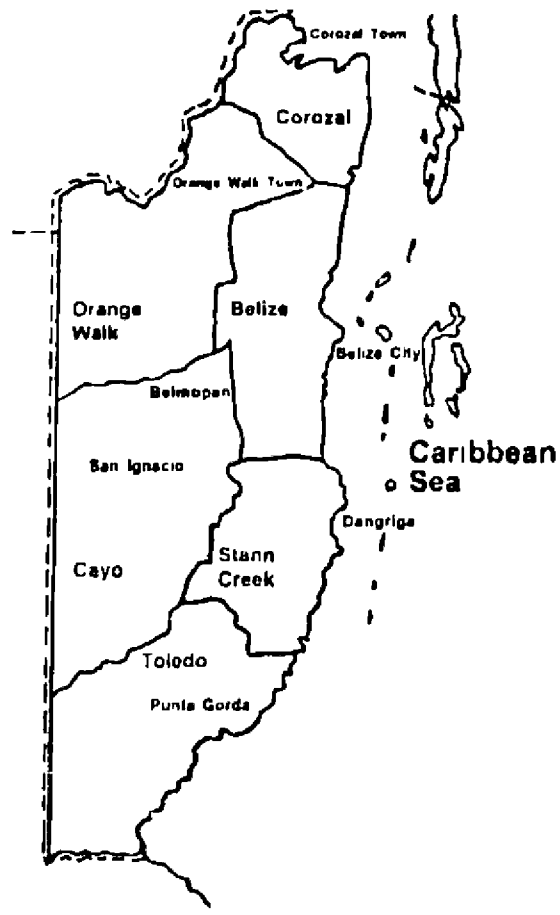
In 1988, plans for a National Nutrition Survey were initiated Various international agencies including PAHO, AID, INCAP, CFNI and UNICEF were prepared to cooperate However, several factors hindered the realization of this survey, nevertheless, the Ministry of Health pursued the idea, encountering basically financial restrictions

In September 1990, Belize was accepted as a member of INCAP's Directing Council The Institute, in its continued effort to support and assist Belize in this endeavor, identified some funds, which were insufficient for a nationwide survey, and therefore the idea to conduct an assessment of the Food and Nutrition Situation through the review of existing information with a multisectoral approach, arose

III. BELIZE PROFILE

Physical features

As can be seen in the map, Belize lies on the eastern or Caribbean Coast of Central America, bounded on the north and part of the west by Mexico, and on the south and west by Guatemala The inner coastal waters are shallow and are sheltered by a line of coral reefs, dotted with islets called "cayos", extending along almost the entire length of the country



The territory consists of 8,868 square miles (22,960 km^2) including 266 square miles of offshore keys comprising 450 islands Administratively, the country is divided into six districts, Corozal, Orange Walk, Belize, Cayo, Stann Creek and Toledo (Figure 1)

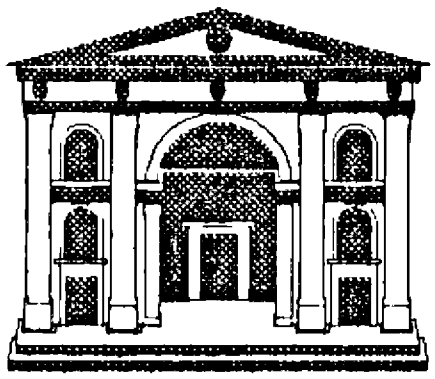
The country is one of contrasts from its landscapes of swampy plains on its Caribbean seaboard, to its mountain passes and rain forests of its land The Maya Mountains and the Cockscomb Range form the backbone of the southern half of the country, being the highest point Victoria Peak (3,699 feet) in the Cockscomb Range The Cayo District in the west includes the Mountain Pine Ridge, ranging from 1,000 to around 3,000 feet above sea level The northern districts contain considerable areas of tableland There are many rivers, some of them navigable for short distances by shallow-draught vessels A large part of the mainland is forest

The climate is subtropical, tempered by trade winds Temperatures in coastal districts range from about 10°C (50°F) to about 35 6°C (96°F), in the inland, the range is greater Rainfall varies from an annual average of 50 inches in the north to 180 inches in the extreme south The dry season usually extends from February to May and there is sometimes a dry spell in August

The capital of the country is Belmopan, built in 1970, and is the seat of the Government Belmopan was created after extensive damage occurred by hurricane Hattie to the former capital city in 1961 Belmopan is situated inland on high ground, practically in the geographic centre of the country, some 50 miles to the southwest of Belize City

Belize City, though no longer the country's capital, remains by far its largest commercial centre, as well as its biggest seaport

Government

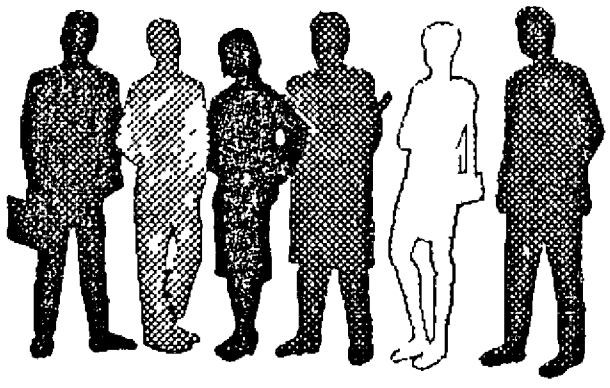


Belize is a democratic, English-speaking country that achieved full independence on September 21st, 1981 The Government of Belize is operated on the principles of parliamentary democracy based on the Westminster System

Because of Belize's political history as a British colony, it maintains the Queen of England as the titular Head of State The person representing the Queen is the Governor General, a Belizean who is appointed by the Queen on the recommendation of the Prime Minister

The administration of the State of Belize comprises three major divisions Legislative, Executive and Judicial The Legislature is called the National Assembly and is made up of two "Houses" --the House of Representatives and the Senate Members of the House of Representative are elected for a "term" with a maximum of five years The Senate is composed of eight members appointed by the Governor General

People



Unlike its neighbors, Belize's small land area is sparsely populated It has the lowest population density in Central America In 1991, the population of Belize was 189,392, giving an overall population density of 21 persons per square mile, even though there are some districts more densely populated than others and an important concentration is found in urban areas Forty-seven per cent of the country's population resides in urban areas Belize District has the highest percentage of urban population (81%), Toledo and Corozal Districts are the ones with the highest percentages of rural population, (81% and 77% respectively) Belize District concentrates about a third, and Belize City 23% of the total country's population (Table 1)

When the population density figures are compared to those for 1980, there is an obvious increase in all districts The most densely populated district is Corozal with 39 6 inhabitants per square mile followed by Belize District with 33 4 and the least densely populated is Toledo with 9 8 persons per square mile

Belize is a multi-cultural as well as a multi-ethnic society The population is simply and overwhelmingly racially heterogeneous The great diversity in ethnicity, language and religion makes Belize culturally rich and sociologically complex

There has been a shift in the dominating ethnic group in the country While the "creoles" used to be the dominating group in the previous decades followed by the mestizo, it is now the mestizos This might be due to the recent large influx of immigrants from Central America and the common practice of many Belizeans, especially young productive-age creoles, to migrate to the United States of America

The Spanish-speaking Belizeans, normally labelled mestizos, account for 44% of the population They are spread throughout the north, west and southern areas of the country in settlements near the borders (mainly Corozal, Orange Walk and Cayo Districts) The Creole comprise 30% of the population and are primarily concentrated in the Belize District Creoles have two distinctive traits Some degree of African ancestry and the use of local English Creole language

Three Mayan groups are distinguished in Belize Kekchi, Mayan and Yucatecan Together they constitute 11% of the total population and are predominat in Toledo, Cayo and Orange Walk/Corozal Districts respectively

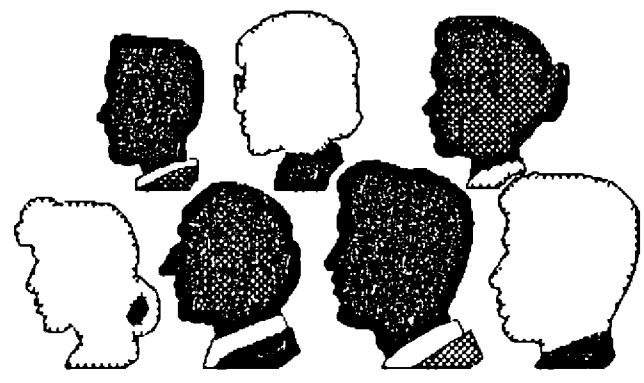
Dangriga is home to the Garifuna (long called Caribs), who represent 7% of the national population They have a distinctive language and culture

Some 5,700 Mennonites reside in Belize Mennonites and Belize officials made agreements that guarantee Mennonites the freedom to practice their religion, to use german in their locally-controlled schools, to organize their own financial institutions and to be exempt from military service

Other ethnic groups such as East Indian, Chinese and Lebanese are scattered throughout the country and account for 4% of the population

Although English is the official language, and the language of instruction in schools, Spanish is also widely spoken It is taught in primary and secondary schools in order to further develop bilingualism Other languages spoken in regional clusters include Garifuna, Maya, Kekchi, and German The majority of the English-speaking or bilingual population also speak "Creole" (an English dialect or `creole patois')

The constitution provides freedom of religion In addition to their partnership with the Government in running the educational system, denominations provide many social and family welfare services About 58% of the population are Roman Catholics, 7% Anglican and 6 3% Pentecostal In most districts approximately 60% of the population are Roman Catholics, with the exception of Belize District with 46% Catholics, and the highest percentage of Anglicans (18%) Other denominations that exist in the country in very small percentages include Methodist, Seventh Day Adventists, Mennonites, Nazarenes, Jehovah's Witnesses, Baptists, Bahai's and Muslims



Demography

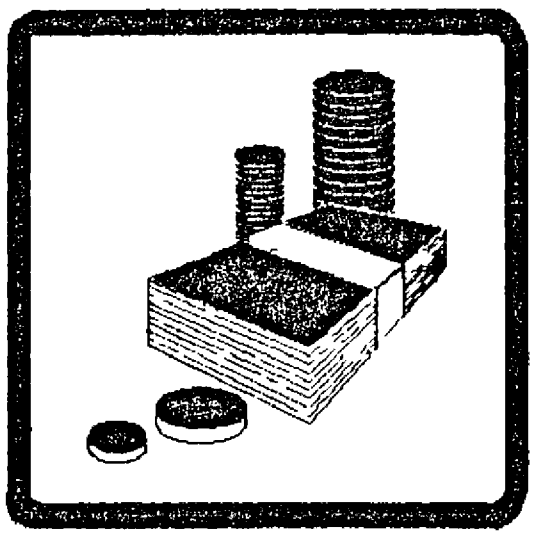
The 1991 National Population Census reports a total country population of 189,392 Of this total, 49 2% were women and 50 8% men It is a "young nation" 44%

or nearly one out of every two Belizeans is under the age of 15 In 1991, 3 1% of the population were under one year of age, 13% under 5 years and 34 2% in the 15-34 age bracket (Table 2 and Figure 2) Life expectancy averages 69 85 years for males and 71 78 for females The percentage of elderly, those 65 years of age and over was 3 5% compared to the value of 4 5% reported in 1980

The average annual growth rate between 1980 and 1990 was 2 75% per year, resulting from a significant amount of emigration to the United States With a much higher birth rate of about 38 1% per year, a declining death rate of 3 9% and a continuous influx of refugees, a more rapid population growth is predicted in the future Belize is also a "fertile nation" 39,982 women are of childbearing age, which is 21% of the total population and 43% of the total women population The total fertility rate is estimated at 5 3

Steady migration into Belize from neighboring Central American countries started approximately in the early 1980's, a clear indication of the sociopolitical unrest in the subregion In 1984 an amnesty program for illegal immigrants was launched by the government of Belize Many of the refugees are unregistered and their precise numbers can only be roughly estimated The Refugee Department, a newly established department in the Ministry of Foreign Affairs, as a result of the new Refugee Act, has reported an estimated total of 8,000 documented and recognized refugees and approximately 7,000 asylum seekers of refugee status are presently in process A repatriation process has been taking place since 1991 with the support of the United Nations High Commission for Refugees (UNHCR)

Economy



Belize has among the best economic growth rates in Central America and at the same time has a falling *per capita* Gross Domestic Products (GDP) Agriculture currently provides some 65% of the country's total foreign exchange earnings, and employs approximately 30% of the total labor force

Although 38% of the total land area is considered potentially suitable for agriculture, only perhaps 10 to 15% is in use in any given year Approximately half is under pasture, with the remainder in a variety of permanent and annual crops The traditional system of "milpa" (shifting cultivation) involves the annual clearing of new land for crop production, however, there is an increasing number of farmers making permanent use of cleared land by mechanical means

The agricultural sector is dominated by the sugar industry, which is concentrated in the Corozal and Orange Walk Districts

The citrus industry, centred in the Stann Creek District, is the second major contributor to export earnings Bananas, again located in the Stann Creek District, are the third largest export crop and Cacao is becoming increasingly an important export crop This crop is being adopted by many farmers, particularly in the Cayo and Toledo Districts Mangoes are also grown commercially, but production fluctuates, mainly due to climatic conditions

The main industries are sugar, citrus, fisheries and bananas Sugar accounts for more than 50% of the country's foreign exchange earnings Because of the uncertain future of sugar, major efforts are being made towards agricultural diversification

IV. SCOPE AND PURPOSE OF THE ASSESSMENT

It is indisputable that the establishment of policies and the choice of appropriate interventions and actions to improve the nutritional status of a population, must be based on a clear reconnaissance and precise information on the food and nutrition situation of the population

Since various conditions hindered possibility to conduct a large-scale detailed study of the nutritional status of the population, an Assessment of the Food and Nutrition Situation was undertaken

The present assessment aims at providing relevant information compiled and analyzed within scientific limits, and justified as a preliminary step for further actions

The primary purpose of this assessment is to analyze the food and nutritional status of the Belizean population based on existing data supplemented by special small scale research This will allow an update of the principal food and nutrition problems by district whenever possible, and to propose acceptable and viable options that may modify the key causal factors responsible for the present situation Ultimately, this information will provide the basis for a National Food and Nutrition Plan for Belize

The approach followed features the close, interrelated effort of the different sectors that are in some way associated with food and nutrition issues of the population, and who will play determinant roles in future actions

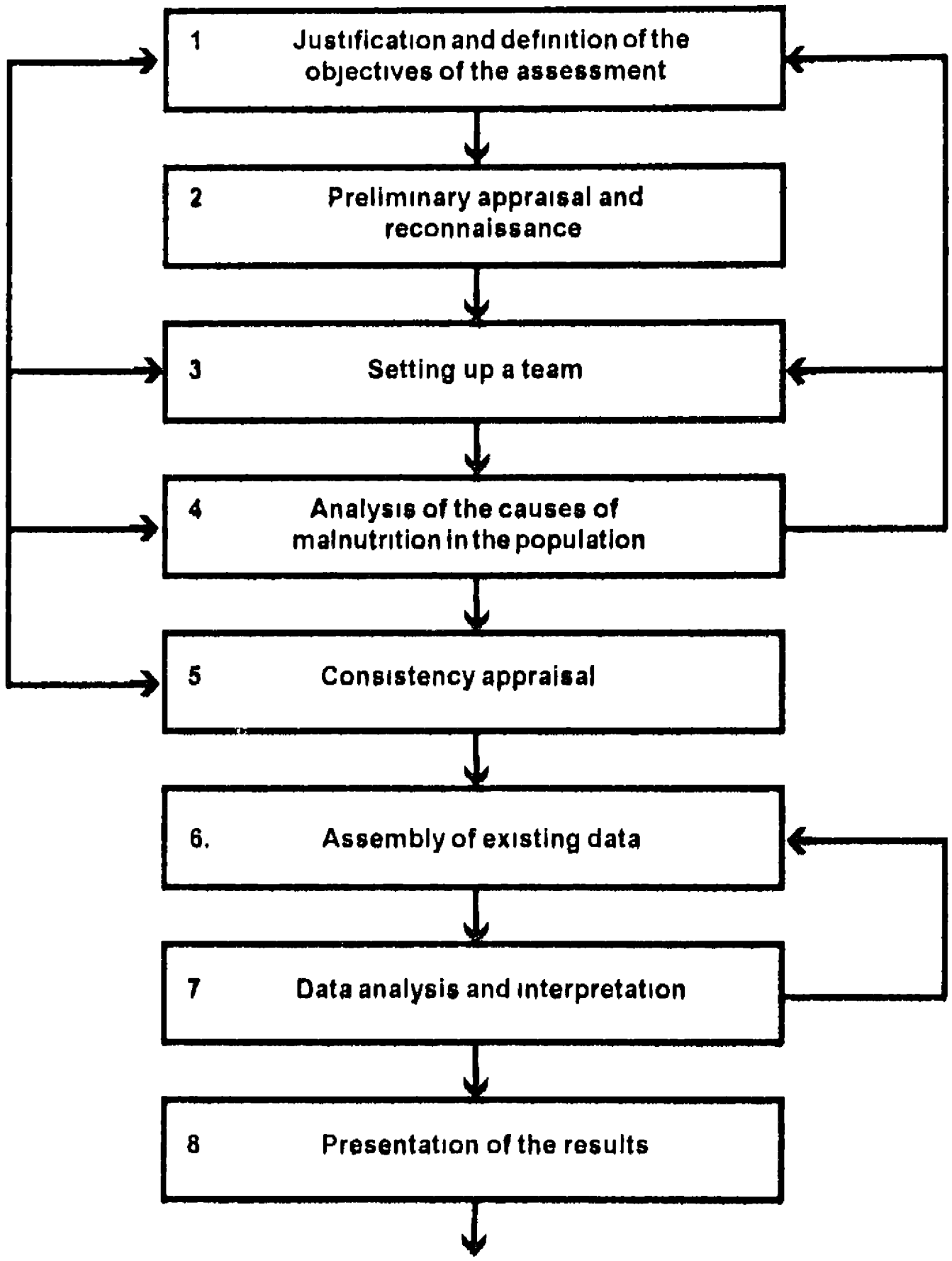
V. METHODOLOGY

The National Food and Nutrition Assessment of Belize began in february 1992, using the guidelines established in "A Guide for Nutritional Assessment" by Ivan Beghin, Miriam Cap and Bruno Dujardin (1)

This guide summarizes the vast experience of the authors and others, who for the past thirty years have been carrying out assessments of valuable length, presentation, purpose, quality and emphasis

It was decided that in general, the steps proposed by these authors would be adapted in the case of the Belize National Food and Nutrition Assessment, since the guide itself is flexible and may be adjusted to a wide range of situations and objectives for the appraisal of the nutritional status of population groups and the selection of priority areas for action

The outlined procedure is divided into the following eight steps



The initial step was the design of a proposal by a core group comprised by the Director of the Maternal and Child Health Programme of the Ministry of Health, INCAP's Basic Technical Group in Belize and a consultant from INCAP Headquarters This proposal defined precise problems, data gaps and objectives for the Food and Nutrition Assessment of Belize (Annex 1, "Proposal")

The main objectives of the Assessment were

1 To review and assess the available information on the food and nutrition situation in Belize

2 To update and describe the principal food and nutritional problems of Belize by district, and establish the main causal factors that produce the present situation

3 To propose acceptable and viable options with an intersectoral approach to modify the key causal factors responsible for the current situation

4 To provide information that enables the evaluation and review of the draft Policy of Food and Nutrition for Belize

5 To strengthen the Belize Food and Nutrition Surveillance System (BFNSS)

This proposal was formally presented by the Minister of Health to the Ministers of Cabinet in a meeting held on the 3rd of March, 1992, where national support for the assessment was obtained

The next step involved a thorough compilation and inventory of all available relevant studies and information, carried out by the core group, to form the basis for the preliminary appraisal and reconnaissance Valuable technical assistance was obtained from CFNI in the overview of information from articles, reports and books on the nutritional problems of the country and the elaboration of an extract or appraisal of the situation (Annex 2, "Appraisal")

An important step was the establishment of a team and the definition of the terms of reference for team members The sectors invited to join in the effort included Agriculture and Fisheries Education Social Development and the Central Statistical Office of the Ministry of Finance (Annex 3)

With a team in place, regular meetings were held to introduce them to background information, purpose, objectives and methodology of the Assessment, and to discuss the role of the team

One of the first major tasks of the multisectoral team was the construction of a hypothetical causal model necessary to provide an understanding of the causal factors that determine the nutritional situation of the Belizean population This was achieved after a series of sessions of intense discussion leading to the development of the final version of the causal model (Annex 4)

This exercise was followed by others, where relevant and feasible indicators for each box in the causal model were identified This was completed with a description of the desired characteristics, data source and individuals responsible for data collection

A review of the purpose and objectives of the Assessment was carried out as a group after the above steps were completed, so as to verify consistency and feasibility of the different stages of the process

Data collection and assembly was organized in a manner that team members were assigned the responsibility to gather specific information and time was allotted for data collection to support the indicators In the area of health, a small-scale study was carried out using information from the health centres on growth monitoring in children under five-years-of-age

The information collected from the different sectors was reviewed and studied by the group This provided the basis for discussion and generation of issues and recommendations from each sector

VI. FOOD, NUTRITION AND HEALTH SITUATION OF BELIZE

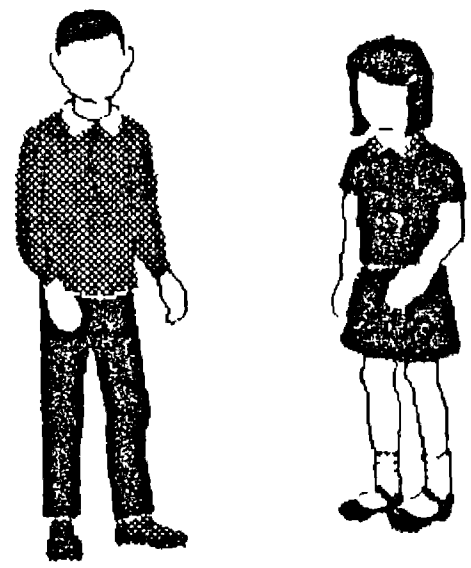
A. Patterns of Health, Nutrition and Disease in Belize

It is known that feeding practices, environmental sanitation, the absence or presence of diseases and access to health services are important factors that may determine the nutritional status of a population Special groups which are particularly vulnerable due to increased need of nutrients are, among others, infants, preschoolers, school age children, adolescents, as well as pregnant and lactating women

Through the Food and Nutrition Assessment, the factors identified in the hypothetical flow chart as possibly affecting the nutritional status of the population are being analyzed with the intention to determine those that may have some predominant effect on the nutritional status of individuals in Belize

1. Children

a) Infant Mortality Rate (IMR)



It is well recognized that child mortality rate, and specifically infant mortality rate is a good socioeconomic indicator

According to official figures, Belize has presented a declining trend in its infant mortality rate throughout the past twenty years However, the decrease was more dramatic within the first decade, where the values fell from approximately 49 per 1000 live births in 1969-70 to 23 in 1982-83 Thereafter, the rates have practically remained stagnant since the rate reported for 1990 was 22 5 (Table 3 and Figure 3)

Information disaggregated by district from 1983 to 1990 indicates that the Belize District has consistently showed the highest rates. One contributing factor may be that the only existing referral hospital in the country is located in Belize City Therefore, the very ill, who are at a higher risk of dying are referred there On the other hand, Orange Walk and Cayo Districts have consistently reported the lowest IMR in the period (Table 4)

Causes of Infant Mortality

It is interesting to study the decreasing trends in the infant mortality rate, correlating it with the causes of such deaths throughout the years The highest IMR that prevailed even up to 1980 was primarily associated with infectious diseases (such as diarrhoea and respiratory infections), followed by perinatal causes

On comparing the principal causes between 1980-81 and 1982-83, when there was an IMR reduction from 30 to 23/1000 live births, it is evident that the decrease was basically at the expense of a decline in the mortality due to diarrhoeal and respiratory infections This reflects

the progress obtained through specific programmes aimed at reducing these infectious diseases, as well as vaccine preventable diseases There was almost no variation in the rates for perinatal causes (Figure 4)

Thereafter, throughout the 80's, as mentioned earlier, the IMR tended to stabilize with a similar pattern in causes with the observation that by 1988 official information showed that perinatal causes was the first cause of death (9 7/1000 live births), and accounted for 47% of all deaths in children under one year Other causes included Respiratory system diseases (3 7, 18%), congenital anomalies (1 5, 7%) and signs and symptoms of ill-defined conditions (1 3 6%) (Table 5)

Information on infant mortality rate from another source, the 1991 Population Census, shows values that largely contrast with the previously discussed official figures According to this source, the IMR for the country was 35 per 1000 live births, Toledo and Stann Creek Districts with the highest rates of 54 and 43, respectively and the lowest in Belize with 23 (Table 6)

Published official figures on neonatal deaths for the 1980-1988 period ranged from 11 to 14 9/ 1000 live births, which accounts for a considerable portion of the IMR (Table 3)

Another source of information, a study on "Maternal and Child Mortality in 1991" by Moguel (17) who collected information of death certificates countrywide, shows an IMR that is very similar to the Census figure, and indicates a Neonatal Mortality Rate of 20 4 per 1000 live births These deaths in children less than 28 days represented 58 4% of all infant deaths, and the principal causes were respiratory distress (20%), prematurity (14 4%), congenital anomalies (13 6%) and sepsis (9 6%) Other important causes included hypoxia, aspiration and asphyxia (Tables 7 and 8)

Information from this same study, disaggregated by district indicates that the Belize and Cayo districts have the highest neonatal mortality rates with 29 6 and 25 9 per 1000 live births, respectively Toledo was reported with the lowest rate (6 6) although it must be mentioned that information for this district was not completely available (Table 7)

As can be observed, specific studies indicate an overall IMR higher than the official figure, and a different distribution of infant deaths by district This supports the concern related to under reporting of deaths and/or inadequate diagnosis recorded in death certificates regarding direct causes of death

b) Child Mortality Rate (CMR)

In regards to official figures on mortality in children between one to four years of age in the country, the trend during the 1982-1989 period fluctuated between 1 3 to 2 2 child deaths per 1,000 inhabitants (Table 3)

Existing information related to child mortality by District is available only from Moguel's Study on "Maternal and Child Mortality, Belize 1991" (17) Belize, Cayo and Stann Creek had the highest rates of 3 0, 2 9 and 2 6 per 1000 children between one-four years, respectively and the lower rates were found in Corozal, Toledo, and Orange Walk The overall CMR according to this source did not differ much from the official figures from previous years Data on the causes of child mortality is not easily available from the MOH information system Nevertheless, the Moguel Study indicates that in 1991 more than 50% died from respiratory diseases and dehydration (Tables 9 and 10)

c) *Nutritional Status of Children Under Five Years*

To evaluate the nutritional status of children under five years of age, the members of the Nutrition Assessment Team carried out a study, whereby data from all health centres of the country was collected for the period of January to March 1992

The information used was obtained from the Growth Monitoring Clinic cards, weight and age being the data mostly available For the purpose of this study, data was analyzed using weight-for-age as an indicator for global nutritional status The WHO classification[1] with a cut-off point of -1 Standard Deviation for malnutrition was used (21) It is important to keep in mind that this information was limited to clinic-attending population whose characteristics may differ from that of the general population, whereby the size of the samples is not representative, and the results may be biased It is important to note that those children in the "mild malnutrition category" accounting for the majority of cases are representing those who, by WHO standards do not have the optimum weight-for-age and are at risk of becoming moderately or severely malnourished if adequate measures or interventions are not taken

Data from 8,516 children was studied, which approximately accounts for 28% of the country's population under five years On a countrywide level, (5,045) 59 2% of the children were considered normal by the indicator weight-for-age, while (1,631) 19 2% were mildly malnourished, (418) 4 9% were moderately malnourished and (112) 1 3% were severely malnourished Overall, 25 4% of the children were suffering some degree of malnutrition The most affected age groups were the one to two years, followed by the six to 12 months On the other hand, (1,222) 14 4% of the children were at some risk of obesity and (88) 1 0% were obese (Tables 11 and 12, and Figures 5 and 6) The results obtained by District are presented in Figure 7

Corozal

Sixteen percent of the Corozal's population are children under five years of age Data from 1,518 children were analyzed which corresponds to 33% of the population in that age group

The analysis indicates that (885) 58 3% of the children were considered normal and (465) 30 6% presented some type of malnutrition (360) 23 7% were mild, (78) 5 1% moderate and (27) 1 8% severely malnourished In Corozal, the problem of undernutrition appears to be affecting those children one to two years old

On the other hand, 9 8% of the children presented mild or moderate obesity and 1 2% were obese (Tables 11 and 13)

Orange Walk

Seventeen percent of Orange Walk's population are children under five years Data from 1,172 children were revised in the study which accounts for 23% of children in this age group

[1] Cut off points used Severe malnutrition < -3 SD, Moderate malnutrition -2 to -3 SD, Mild malnutrition -1 to 2 SD Normal -1 to +1 SD, Mild obesity +1 to +2 SD, Moderate obesity +2 to +3 SD, Obesity > +3 SD

In this district, (687) 58 6% of the children were considered normal by the weight for-age indicator and (349) 30% presented some degree of malnutrition 277 (23 6%) were mild, 65 (5 5%) moderate and 7 (0 6%) severely malnourished The children mostly affected are those one to two years of age

The problem of overnutrition was also present with 11% having mild or moderate obesity and 0 4% were obese (Tables 11 and 14)

Belize

This district has 14 0% of its population under five years of age The records of 2,454 children were included in the study, representing 33% of the population under five years

In the data analysis, 1,531 children (62 4%) were found to be in the normal category and (399) 16 3% with some degree of malnutrition (304) 12 4% were mild, (69) 2 8% moderate and (26) 1 1% severely malnourished The age groups where most of the problem occurred for severe malnutrition were infants six to 11 months, and for mild and moderate malnutrition children one to two years

Twenty percent of the children had mild or moderate obesity and 1 4% were obese (Tables 11 and 15)

Cayo

The number of children under five years of age in the Cayo district is 6,106 or 16 7% of the total district population Data for (2,384) 39% of these children were analyzed

Results showed that (1,420) 59 6% of the children were in the normal category and (630) 26 5% presented some degree of malnutrition 20 0% were mild, 5 1% moderate and 1 4% had severe malnutrition The one to two years age group was the most affected in more than 50% of the cases On the other hand, (312) 13 1% of the children of this district had mild or moderate obesity and (22) 0 9% were obese (Tables 11 and 16)

Stann Creek

Sixteen percent of this district's population is made up of children under five years of age Data from 619 children were analyzed which is 22% of those in that age group Of these, (351) 56 7% were in the normal category and (151) 24 4% had some degree of malnutrition 16 8% were mild, 5 8% moderate and 1 8% severely malnourished The age group that was mostly affected were those children one to two years and six to 12 months On the other hand, (110) 18 0% of the children studied had mild or moderate obesity and (7) 1 1% were obese (Tables 11 and 17)

Toledo

Twenty percent of Toledo's population is under five years of age Data for 369 children were analyzed which is 10 6% of those in that age group Of these, (171) 46 3% were in the normal category for weight-for-age and (167) 45 3% had some degree of malnutrition 29 8% were mild, 13 3% moderate and 2 2% severely malnourished The one to two years age group was the most affected

There were indications of overnutrition in (29) 7 8% of the children who presented mild or moderate obesity and (2) 0 5% were obese (Tables 11 and 18)

Data collected and analyzed in 1981 by the Caribbean Food and Nutrition Institute using the Gomez classification, also indicated Toledo as the District with by far the largest prevalence of malnutrition (Table 19)

d) Infectious Diseases

Recognizing the importance of diarrhoeal diseases, vaccine preventable diseases and acute respiratory infections as major contributors to morbidity and mortality in children under five years of age, the World Health Organization (WHO) established global programmes for the control of these diseases In the early 1980's, Belize through the Ministry of Health, integrated and adopted these efforts into the Maternal and Child Health Programme (MCH) with the purpose of controlling these childhood diseases, thus reducing preventable deaths

At the national level, the Programme for the Control of Diarrhoeal Diseases (CDD) and the Expanded Programme of Immunization (EPI) were the first to be introduced

Diarrhoeal Disease

Information on the occurrence of diarrhoeal disease is not easily available through the Ministry of Health's information system (9) However, there is recent information on diarrhoea in children under five years in Belize derived from the 1991 Family Health Survey (8) It is not presented by District but it is reported by ethnic groups, which provides a general idea of the localization of the problem

The above Study reports that almost 11% of children under five years of age had a diarrhoeal episode during the two weeks prior to the interview In general, the prevalence of diarrhoea was slightly higher in the rural (12 2%) than in the urban areas (9 9%), but when analyzed by age groups the percentages for children under one year were higher for the urban area Overall, the percentages considerably decreased in children over three years (Table 20)

Information analyzed by ethnic group, shows that the Mayan Kekchi reported the highest prevalence of diarrhoea (15 2%), followed by the Mestizo (12 3 %), Garifuna (7 7%) and Creole (7 5%) (Table 21)

Acute Respiratory Infections (ARI)

ARI Programme activities have been difficult to initiate in Belize due to various limitations Training of health care providers has taken place on a continuous basis, but norms are still being revised and yet to be approved This has been a major drawback in the formal implementation of the Programme

Information on ARI has not been easily available over the years, therefore for the purpose of this assessment, information was obtained from the "1991 Belize Family Health Survey" Forty percent of the children were reported to have symptoms of ARI Mild episodes of respiratory infection were the most prevalent form of ARI in the two weeks prior to the interview, representing 18 1%, 16 0% were moderate and 7% severe

Almost 50% of children under one year of age and those between 12 to 23 months presented some form of ARI Severe infections occurred in about 10% In older children the prevalence was between 30 to 40% and severe infections occurred in less than 5%

When examined by ethnic groups, the Maya-Kekchi and the Garifunas presented the higher prevalence (48% and 47% respectively) Creole, Mestizo and other groups ranged from 34% to 40%

Vaccine Preventable Diseases

In 1979, the Expanded Programme of Immunization (EPI) was introduced and integrated into the Maternal and Child Health Services Since then, the management of immunization activities have significantly improved

EPI coverage expressed as a percentage of the under one year age group has presented a slowly ascending trend from 1984 In 1986, a National Immunization Campaign was launched with the main purpose of accelerating the increase of coverage countrywide

In 1987, a slight decline was observed in the coverage in comparison to the previous year but thereafter, the values again increased In 1991, the coverage for Measles and Polio was 80%, DPT increased to 84% and BCG reported 80% (Table 22 and Figure 8)

In regards to reported cases of immuno-preventable diseases in children, the last case of polio was reported in 1980 Measles has presented a striking declining trend from 607 cases in 1980 to 10 cases in 1991, with the exception of 1986, when there was a total of 124 cases In regards to diphtheria there were four cases in 1982 and one in 1987 The last case of neonatal tetanus was reported in 1987, two reported cases in 1981 and four in 1982 Pertussis has also observed a marked reduction, 11 cases in 1980, 55 in 1981, 36 in 1985 and four in 1991 (Table 23)

Belize has joined a regional initiative to eliminate measles by 1995 This entails a very active surveillance system, enabling to make laboratory confirmed diagnosis of all cases of rash and fever including measles

e) Breastfeeding and Weaning

The Ministry of Health, through its MCH Programme, promotes breastfeeding, emphasizing exclusive breastfeeding for four to six months with supplemented breastfeeding recommended for as long as possible as indicated by WHO norms The promotional activities are done in coordination with the Breast is Best League (BIB), a non-government organization whose main purpose and goal is to promote and increase breastfeeding and appropriate weaning practices in the community through its volunteers' network

Data obtained from the "Update of Food and Nutrition Statistics, 1979-1984" by Sandra Farnum indicates that 40% of babies attending the Child Health Clinic countrywide were exclusively breastfed up to four months of age The Corozal, Cayo and Toledo Districts presented the highest percentage and Belize, Orange Walk and Stann Creek Districts had the lowest (9)

According to the MCH Report for 1991, 27 2% of children under one year of age were exclusively breastfed up to four months of age At the district level, the percentage of exclusively breastfed babies vary considerably, the highest percentages were in the Toledo (58 4%), Stann Creek

(38 5%) and Cayo (33 0%) Districts, and the lowest were in the Orange Walk (17%), Corozal (18 0%) and Belize (19 1%) Districts (Table 24)

The Toledo and Cayo Districts consistently presented the highest percentage of babies exclusively breastfed up to four months of age

The "1991 Belize Family Health Survey" indicated that about 24 percent of infants under one year of age were exclusively breastfed for the first three months This figure is comparable to the one quoted by the MCH Report for the same period It is important to note that for the purpose of the Family Health Survey, "exclusive breastfeeding" was considered up to three months of age It was also found that exclusive breastfeeding was less common in urban areas, among the Creoles, with first born children, by more educated women, and younger mothers

Assuming that the figure of 40% stated by Farnum and the ones previously discussed are comparable, the information indicates that in a period of approximately 10 years there has been a decrease in the percentage of exclusively breastfed babies from 40 to approximately 25%

There is no available data from the Medical Statistical Office on weaning practices, since this type of information is not being collected by the system

On reviewing the information obtained from Belize's experience in the analysis of growth monitoring data of children attending the Child Health Clinics, it can be observed that, of the children under one year that are being affected by some degree of malnutrition, the situation is more predominant in the age group 6 to 11 months, which is the time when weaning begins. In the age group under six months, the Toledo District presented the lowest percentage of infants with some degree of malnutrition, which could be attributable to the fact that this is the district with the highest percentage of exclusively breastfed babies There seems to be an inverse relation between the practice of exclusive breastfeeding up to four months and the prevalence of malnutrition in children under six months by district (see Figure 9) On the other hand, the age group 6 to 11 months presents a significant increase in the percentage of infants with some degree of malnutrition, this stands for all the districts with the exception of Belize, being the highest in the Toledo District This situation could be indicating inappropriate weaning practices (Tables 12 to 18)

f) *Anaemia in Schoolchildren*

The assessment of haemoglobin values in children under five years is not a routine service offered by the MCH Programme, therefore, data is not available on anaemia in this age group Anaemia can interfere with a child's growth and well-being, and may indicate inadequate dietary patterns in population groups

In 1989, Lincoln University carried out an "Assessment of Vitamin A Status of Children in Belize" (18) and at the same time an analysis was also done for haemoglobin and hematocrit values The sample consisted of children three to eight years of age from the major ethnic groups in the country, taking 11 0 g/dl as the normal haemoglobin values for children in this age group The data indicates that anaemia is not a serious problem in the population studied, except in Garifuna and East Indian children who had mean values of 10 7 g/dl and 10 9 g/dl respectively, values slightly lower than normal (Table 25)

g) Vitamin A and Zinc Status in Schoolchildren

In regards to vitamin A, the biochemical data on the Relative Dose Response Test (RDR) showed that approximately 40% of the children studied had adequate vitamin A liver reserve (RDR <20%) and 55% had marginal vitamin A deficiency (RDR values between 21% and 50%) About 5% of the children had very low liver reserve of vitamin A (RDR >50%) (Table 26 and Figure 10)

The Garifuna, East Indians and Kekchi children had lower vitamin A reserves compared to other ethnic groups (Table 27)

Zinc serum levels were also assessed in the same sample, and the study found low levels (<80 µg/dl) in approximately 40% of the children (Figure 11)

2. Health of Pregnant Women

a) Utilization of Health Services

The Health Service in Belize has only one structured programme for women --The Maternal and Child Health Programme (MCH)-- which is targeted towards women in reproductive age

The MCH Programme traditionally has cared and offered services addressing women's reproductive needs, therefore the needs of other specific age groups are not known and not met It has been only recently that the Ministry of Health (MOH) joined the Subregional Project that addresses "The Integral Health of Women", a new concept and approach to address women's health issues

No specific data is available on the nutritional health of women Nevertheless, information on maternal mortality, anaemia, low birth weight as the outcome of pregnancy, may indirectly indicate women's health status and to a lesser extent, the existence of nutritional deficiencies, besides identifying those infants already born at a disadvantage for optimum growth

b) Prenatal Care

For 1991, the MCH Programme reported an overall 80% coverage of prenatal care, the highest being in the Cayo (92%), Orange Walk (91%) and Stann Creek (90%) Districts, the lowest in Belize District (67%) (Table 28)

This high coverage of prenatal care is also reflected in the "1991 Family Health Survey" (8), which indicates that for all live births that occurred within five years of interview, 95% of these women received prenatal care during pregnancy This percentage includes other sources of prenatal care and as can be noted, government facilities was the primary source (Table 29, and Figure 12)

Another important outcome of this study is the fact that of live births for which prenatal care was obtained, less than half received their first prenatal check-up during the first three months of pregnancy, which indicates that almost 50% of the women delayed their first prenatal check-up until the second trimester of pregnancy and 4% did not initiate prenatal care until the last trimester The Study showed no significant differences in the use of prenatal services according to place of residence, education and ethnic group

For those women who received prenatal care, 75% had five or more examinations during their pregnancy Again, women who live in urban areas and women with more education were more likely to have made five or more prenatal visits than rural women and women with less education

Creoles and women whose ethnic group was classified as "other" made the most prenatal visits compared to other ethnic groups

The norm of the Belize Ministry of Health recommends that women receive two doses of tetanus toxoid during their first pregnancy and one dose during each subsequent pregnancy After this, a booster is given every five years The "1991 Belize Family Health Survey" reports that 84% of pregnancies resulting in a live birth had received at least one dose

Type of Deliveries

The Ministry of Health's figures for 1991 reported approximately 76% of institutional deliveries and 24% of deliveries at home or private clinics

On analysis by district, the Belize and Cayo Districts had the highest percentages of institutional deliveries (94 and 77% respectively) and the lowest was Toledo District with 36% (Table 30 and Figure 13)

The deliveries at home or private clinics were attended by a variety of health personnel including traditional birth attendants (TBAs), trained and untrained, nurse midwives, single trained midwives and private physicians (Table 31)

Of the total deliveries in the country, 13% were assisted by TBAs The Orange Walk and Toledo Districts presented the highest percentage of deliveries by TBAs (Table 32)

The MOH has been training TBAs for many years and there is an established Programme that ensures continuous training and registration of TBAs countrywide Currently, there are approximately 125 TBAs of whom 95 or 76% are trained and 30 or 24% are untrained The number of untrained TBAs may be higher since it fluctuates from time to time

The "1991 Belize Family Health Survey" reports a situation fairly similar to the one described above More than 75% of births occurring in the last five years were delivered in either a government or private hospital and 21% were delivered at home This survey indicates that approximately 90% of births to Creole and Garifuna women were delivered in a hospital, compared to only 52% for the Maya-Kekchi

Postpartum Care

Postpartum services have slowly developed and need more attention, especially in regards to educating the mother about the importance of receiving this specialized care In

general terms, the coverage is low, which indicates the poor organization and follow-up of postpartum care in the Government services (Figure 14)

In relation to postpartum care, there is little information available from the MOH's medical statistics The "1991 Family Health Survey" indicates that less than 50% of live births in the past five years were followed by the use of postpartum services by the mother (40 3%) In any case, urban women were more likely to receive postpartum care than rural women, and regarding ethnicity, the Creoles and Garifuna reported the greatest use of postpartum care In addition, the likelihood of receiving a check-up was positively associated with high educational attainment (Table 33)

c) Maternal Mortality

Most of the evidence on maternal mortality is fragmentary and indirect Thus hospital data point to high rates but are misleading when it comes to exact levels Civil registration data, where they exist, are almost always incomplete

In Belize, vital registration and hospital statistics have been the source of data for maternal deaths Over the last ten years, the official Maternal Mortality Rate (MMR) has been reported between a range of two to four deaths per 10,000 live births per year (Table 34)

In 1989, a review of maternal deaths for the period 1979 to 1989 was conducted by Smith (20), medical officer of the MOH The results contrast considerably with those from the hospital statistics He found rates ranging from four to 13 maternal deaths per 10,000 live births in the same priod per year (Table 35)

The causes of maternal deaths in this period were primarily due to direct causes (75 4%), being the most important abortion, infection, haemorrhage and toxaemia Other causes were ruptured uterus and cesarean section complications

This discrepancy in MMR created a major concern, and since then the Ministry of Health has conducted reviews in 1990 and 1991

The 1990 review report by Moguel (16) indicates a total of 14 maternal deaths for the country, corresponding to a MMR of 19 9 per 10,000 live births, the highest rate reported since 1979 The Corozal District with the highest rate (34 7) and the lowest in the Belize District with 8 9 (Table 36) The main cause of maternal mortality was postpartum Haemorrhage (Tables 37)

The 1991 review shows a total of 9 maternal deaths corresponding to a MMR of 14 7 per 10,000 live births, a decrease of 35 7% from 1990 (Table 39) The main causes of mortality were Eclampsia and postpartum haemorrhage (Table 39)

In general, the information presented above indicates major problems in the existing vital registration system and what is recorded in the death certificates The reviews conducted show MMR two to three times higher than the official reported rates (Figure 15) In 1990, Cayo and Corozal had the highest maternal deaths and in 1991 Belize, Toledo and Stann Creek Districts This is a clear indicator of the presence of high risk groups in nearly all districts of the country

The causes of mortality vary from year to year, but it can be said that the principal contributors are postpartum haemorrhage, eclampsia, infection and abortion The wide scope of conditions

may indicate problems in the general care of pregnant women, especially during delivery and immediate postpartum periods It is worthwhile mentioning that child spacing services are not available within the government services

d) Anaemia in Pregnant Women

The Update of Food and Nutrition Statistics, 1979 - 1984 by Sandra Farnum (9) states in its analysis, that "43% of women receiving antenatal services in Belize Country had an haemoglobin level of less than 11 g/dl ", according to clinical statistics for January to March, 1984 The problem of low haemoglobin levels was most predominant in the Stann Creek, Toledo and Belize Districts with 78, 67 and 58%, respectively

In 1988, a study by Hof (10) on "Anaemia in Pregnant Women Attending Prenatal Clinics in Belize" provided data from 15 health centres on 3,860 pregnant females at their first visit In this study, it is indicated that for all calculations, the WHO definition for anaemia (Hb<11 0 g/dl) was applied This is also the cutoff point utilized by the MCH Programme in Belize A total of 40 2% of the antenatal patients were identified below this value

It was also found that in 16 8% of the patients, the haemoglobin was less than 10 g/dl Cayo and Toledo Districts showed the highest prevalence with 23 1 and 21 9%, respectively, while Stann Creek had a comparable low prevalence of 8 1% A high proportion of women had values between 10 and 10 9 g/dl (Table 40 and Figure 16)

The Study reveals no significant difference (p>0 05) between the urban and rural populations and also states that "there is evidence that haemoglobin levels of antenatal patients in Belize decrease with increased number of pregnancies"

e) Low Birth Weight

Medical statistical data for 1991 indicates an overall 5 5% of infants with low birth weight (< 2,500 g), the values ranging with very low figures of 2 1% in the Corozal District to 7 9% in the Belize District (Table 41)

The Update of Food and Nutrition Statistics, 1979-1984 by Farnum (9) reports Belize City Hospital statistics on low birth weight (LBW) and states "Assuming that Belize City Hospital Statistics are representative of the Country, then approximately 10% of all infants born between 1981 and 1983 were born at a disadvantage to optimum growth"

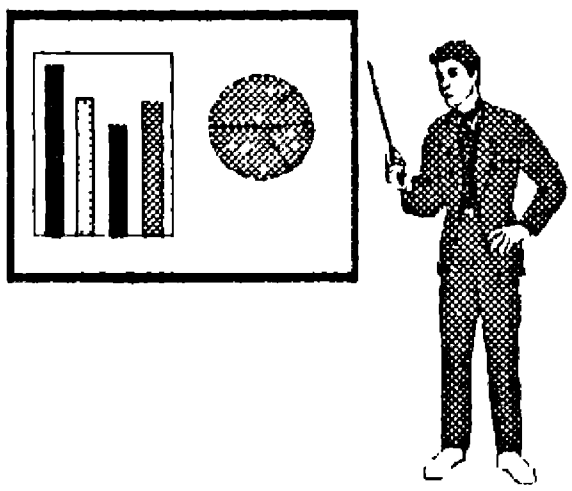
Belize City Hospital statistics for 1991 reports 8 2% of LBW, much higher than other district hospitals This may be due to the fact that this is the Country's Referral Centre, therefore the Hospital is also serving the other five districts

In a recent study conducted from January to March, 1992, records of children under five years were reviewed for birth weights This analysis indicated a range of LBW of 3 4% in the Stann Creek District to 9 9% in Corozal (Table 42)

Although the values from the different sources presented are not necessarily comparable, they are all very low when compared to the incidence of low birth weight in developed countries, which makes one suspicious of the reliability of the figures (Figure 17)

3. Trends in Morbidity and Mortality

a) Morbidity



The principal causes of hospitalization for 1990 and 1991 were used to reflect the principal morbid conditions that affect the population Information was not available by age group or gender Excluding the normal deliveries, the highest rate of morbidity was occupied by other diseases of the respiratory tract (with rates of 5 9 and 5 8 per 1000 population, respectively) followed by abortion (5 3 and 5 4) and diseases of other parts of the digestive system (5 2 and 5 0) The conditions that followed were intestinal infectious diseases, endocrine, metabolic and immunity disorders, hypertensive/heart diseases and certain conditions originating in the perinatal period (Table 43 and Figure 18)

Information by District on principal causes of hospitalization is available for 1989 Again, excluding normal deliveries, which accounted for the largest number of admissions in all the districts, the conditions that feature the highest rates also include other diseases of the respiratory system, diseases of other parts of the digestive system, intestinal infectious diseases, direct obstetric causes and abortions Hypertensive disease and endocrine disorders continue to appear among the ten main causes of hospitalization in most districts (Tables 44 to 49)

Corozal and Cayo Districts both include "mental disorders" and the Toledo District reported rickettsiosis and other arthropod-borne diseases in its principal causes for that year

b) Communicable Diseases

Regarding communicable diseases, the most reliable data is the one on malaria, since there is continuous surveillance of cases countrywide This is not the case for other communicable diseases which, due to a deficient "notification system", has produced over the past years reports that are inconsistent and unreliable

Malaria incidence seems to have been under complete control during the sixties and seventies The decade of the fifties and most recently the eighties and nineties have seen the highest incidence of malaria in the past 50 years

The increase in the rate of cases of malaria per 1000 inhabitants since the early 1980's has coincided with the increased influx of migrants from neighboring countries In the 1980's, the Country experienced the highest peak of 29 1 in 1983 (Figure 19)

In 1990, the rate of Malaria for the country was 16 6 per 1,000 population, with the highest rate in Toledo (47 6) and Cayo with 35 5 In 1991, the country rate was 20 per 1,000 inhabitants, but in this case the rate for the Cayo District increased considerably to 55 3 malaria cases per 1,000 population (Table 50)

The ten most positive localities in the Cayo District include the major refugee and immigrant ladino communities with the highest rates These are communities that have recently developed as a result of civil unrest and poor opportunities in neighboring Central American countries

c) Mortality

General Mortality Rate

For the past twenty years, the total death rate of the country has had a slight downward trend In 1970, the total death rate was 6 8 per 1,000 inhabitants and 4 9 in 1980 In 1989, the death rate decreased to 4 2, a figure comparable to that of Panama (4 0) and Costa Rica (3 8) (19) When analyzed by sex, the male death rates tend to be slightly higher (Table 51)

Trends in General Mortality Rates by District

The General Mortality rates for the different districts of Belize also tended to decrease throughout the past few decades with the exception of the Belize District that had a figure of 7 3 per 1,000 inhabitants in 1970, 6 6 in 1980 and then 8 0 in 1990 (Table 52 and Figure 20)

Age-specific Mortality Rate

Age specific mortality rates for 1980 and 1989 showed that the different age groups maintained very similar values with the exception of the 0-4 years group, which declined from 10 8 to 5 5 per 1,000 inhabitants in the ten-year period This information is very important, since it may be indicating that the MOH efforts to control infectious diseases such as diarrhoea, respiratory infections and vaccine preventable diseases in this age group has certainly had a favorable effect on reducing mortality Age-specific mortality data by district was not available (Table 53)

Proportional Mortality

Not surprisingly, the age group of 65 years and over accounts for the largest percentage of all the deaths, both in 1981 (41 2%) and 1990 (43 1%) Infants were the second highest age group accounting for 22 6% in the former year and 17 3% in the latter The mortality of the one to four year age group as a percentage of the total deaths reduced from 7 2% in 1981 to 4 8% in 1990 On the other hand, the corresponding figure for the 15-44 year age group increased from 8 6 to 14 3% (Table 54)

Causes of Mortality in the Country

The principal causes of death in the country have followed a similar pattern in the recent years, although in some cases the rates have increased

The main causes of death for 1983, 1984, 1989 and 1990, include heart diseases with the highest rates in most years, while respiratory and cerebrovascular diseases, as well as hypertension also account for many deaths with a trend to increase through the years It is worthwhile to note that conditions originating in the perinatal period was presented in sixth place in 1983 and 1984 with rates of 0 3 and 0 2, and in 1989, while in 1990 these conditions appeared

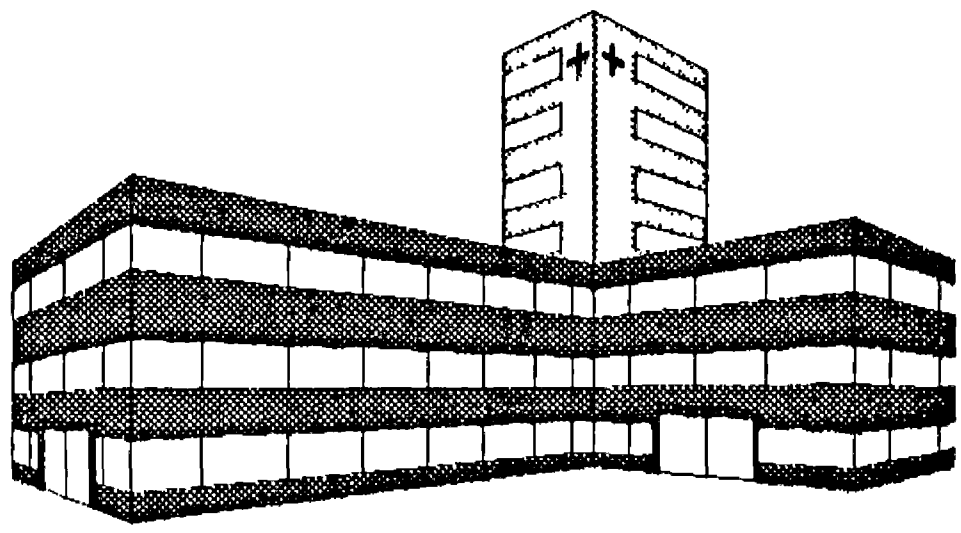
in second place only after heart diseases with rates of 0 7 and 0 9 per 1,000 habitants Cancers, accidents, diabetes mellitus and diseases of the digestive system are also included in the ten principal causes of mortality (Tables 55 and 56, and Figure 21)

When chronic diseases are grouped together and expressed as a percentage of the total mortality for three different years (1976, 1986 and 1988), there was an obvious change in the pattern They accounted for 17 9%, 27 5% and 26 9% of all deaths, respectively This includes hypertensive disease, endocrine/immune disorders, ischemic heart disease, cerebrovascular disease, atherosclerosis and malignant neoplasms (Table 57 and Figure 22)

These same diseases were present in the six principal causes of death in all the districts (with the exception of Toledo and Cayo) with rates ranging from 0 21 to 0 73 per 1,000 inhabitants In Toledo and Cayo, signs and symptoms of ill-defined conditions figured as principal cause with rates of 0 75 and 0 58 per 1,000 inhabitants The other four principal causes for Toledo were intestinal infectious diseases, nutritional deficiencies, other diseases of the respiratory system and congenital anomalies For Cayo, these include other diseases of the respiratory system, conditions originating in the perinatal period, other accidents (including late effects), and vehicle-related accidents (Tables 58 to 63)

To a certain extent, chronic diseases have been associated with inadequate dietary patterns. In Belize, increased morbidity and mortality due to these diseases may be related to the fact that the apparent increase in food availability in the past decades has been largely at the expense of simple sugar, food from animals, and fats and oils (Table 64) Thus, the total fat availability per person per day during the 1961-1988 period increased from 56 to 73 grams compared to the recommended 42 grams Seventy percent of the fat is derived from animal sources, thus increasing the consumption of saturated fats, which have been strongly associated to chronic diseases
(Table 65)

4. Health Services



The Government of Belize recognizes health as a basic human right and a fundamental aspect of the development process, and is committed to provide health services to every Belizean, using community participation and intersectoral coordination as key elements
The national health policy is guided by the principles of democracy, comprehensiveness, education, participation, and accessibility

Government health services are practically free, funded by central government revenues, including the provision of pharmaceuticals

The basic infrastructure for health care delivery is provided by a national network of 34 health centres, 17 health posts and seven district hospitals There is an overall rate of 1 8 health centres per every 10,000 inhabitants The southern, less populated districts of Stann Creek and

Toledo, have the highest rates of health centres per 10,000 inhabitants (2 3 and 1 8 respectively), while the other districts have rates between 1 4 and 1 6 (Table 66 and Figure 1) Each health centre carries out mobile clinic services to the rural population on a prearranged schedule

There are 388 hospital beds in the country, which gives 2 1 beds per 1,000 inhabitants which appears higher than the values reported for other Central American countries like Guatemala (1 6), El Salvador (1 3) and Honduras (0 9), but lower than those for Panama (3 6) and Costa Rica (2 9) (19) (Table 67)

Forty-seven percent of the total number of hospital beds are in the Belize City Hospital which is the referral centre for the country, and as such receives patients from all the other district hospitals

In 1990, 11,104 (57%) of the 19,643 admissions to the health services were to the Belize City Hospital The global percentage of bed occupancy in this hospital was 75 4% The other 8,539 (43%) admissions were to the district and regional hospitals Orange Walk Hospital had the highest bed occupancy rate of 41 9% and the lowest were for the Belmopan and San Ignacio Hospitals with 29 4% and 21 9% respectively (Table 68)

Information on outpatient consultations to the health services is not discussed here since there are gaps in the data which make it somewhat inconsistent and unreliable for analysis

a) Distribution of Health Personnel

Regarding health manpower, updated information indicates that in 1992 there were 116 physicians in the country, both the public and private sector This gives a rate of 6 3 physicians per 10,000 inhabitants, which surpasses the figures of countries like Jamaica (5 0), Guatemala (4 0) and El Salvador (4 0) (19) By district, the rates of physicians per 10,000 inhabitants range from 12 9 per 10,000 in the Belize District to 2 3 in the Toledo District

In the case of dentists, there is a total of 12 accounting for the private and public sectors, which gives a rate of 0 65 per 10,000 inhabitants This figure is comparative to that of other countries in the region like Mexico (0 6), Honduras (0 95) and Nicaragua (0 93) (19)

By district, the rates of dentists per 10,000 inhabitants range from 1 5 in the Belize District to 0 in the Cayo District (Table 69 and Figure 23)

Belize has a variety of categories of nursing personnel which includes registered nurses who are consequently staff nurses, public health nurses or family nurse practitioners, and there is also the category of practical nurse which includes the rural health nurses

There is a total of 102 registered nurses in the country giving a rate of 5 5 per 10,000 inhabitants, which is higher than the rates reported by Honduras (2 4) and Guatemala (1 37)

In the case of practical/auxiliary nurses there are 135 in the country corresponding to a rate of 7 30 per 10,000 population, lower than the one reported by Honduras (7 8) and Guatemala (10 3) (19)

Information on nursing staff by district indicates that the Belize District, again, leads with the highest rates of 9 4 and 12 2 for registered nurses and practical/auxiliary nurses, respectively, while Toledo has the lowest rate for registered nurses (2 9), and Cayo the lowest for practical/ auxiliary nurses (4 0) (Table 70 and Figure 24)

It must be noted that the main referral hospital is in the Belize District and receives patients from the other districts, which may account in part for the higher concentration of health personnel in this district

Other health personnel of the Ministry, expressed as a rate per 100,000 inhabitants include one nutritionist (rate 0 5), five health educators (rate 2 7) and 19 public health inspectors (rate 10 3) (Table 71)

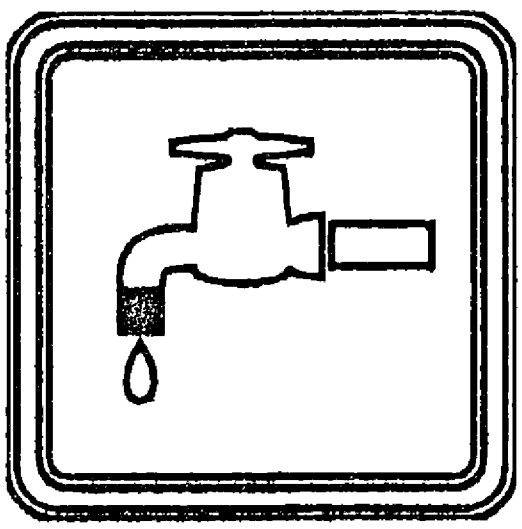
b) Social Security

Compared to other social security schemes in the region, the coverage of the labor force and general population by the Social Security of Belize is low This is in part because of the exclusion of the self-employed and dependents The current Social Security benefit structure is designed to protect the worker against the risk of income loss for the following contingencies sickness, work-related accidents, old age, maternity, invalidity and disablement Dependents receive cash subsidies for survivor benefits only Health coverage is not a benefit except for treatment in the case of work-related accidents

The Social Security makes an annual contribution to the Ministry of Health This assists in the maintenance of the infrastructure and improvement of service delivery by the Ministry of Health to the population

5. Environmental Health

a) Water and Sanitation



Information provided through the Water and Sewerage Authority (WASA) shows that in 1990 there were nine urban water systems, 30 rudimentary water systems (RWS) and 700 handpumps supplying potable water to 80% of the population, and that 43% had adequate sanitation facilities

The "Situational Analysis for Water Supply and Sanitation in Belize, 1990" (CARE, UNICEF) (6) recognizes a distinct rural-urban disparity with 100% of the urban and semi-urban residents with access to clean water compared to only 53% of rural inhabitants Furthermore, 60% of the urban and only 21% of rural populations have adequate sanitation facilities

The 1991 reports from WASA indicate an overall improvement in the provision of potable water and sanitation facilities to the population Nevertheless, the rural areas are still the least benefitted and in need of attention, especially in the area of sanitation

Water Supply

A range of technologies in the provision of potable water to rural and urban populations are used in Belize

In 1991, a total of 85% of the whole population had access to potable water through nine metered supply systems, 780 handpumps and 28 RWS An additional 15% had unimproved sources of water It must be noted that the Corozal and Orange Walk Districts had the highest percentage of population utilizing unimproved sources of water with 34 and 24% respectively

The metered supply system can be found in all six districts of the country serving approximately 61% of the population

In 1991, handpumps were serving approximately 15% of the population Its use has been widespread throughout Belize due to the fact that groundwater supplies are reasonably shallow and of good quality

In the same year, the Water and Sewerage Authority reported a total of 28 rudimentary water systems operational in Belize, serving 9% of the population This system involves filling a central reservoir and then feeding individual homes, usually with yard taps through a network of pipes The system is characterized by local community management system of operation and maintenance

In Belize, rainfall collection is a common practice in both urban and rural communities It is used as a source of water supply for household use, especially for cooking and drinking even when taps and handpumps are available Simple methods employed to collect and store water are raising the question of sanitary conditions (Figure 25)

Water Quality

A common problem is bacteriological fecal contamination due to proximity of latrines to water sources Large sections of Belize are characterized by very high water tables and the porous nature of some of its subsoils

There are two separate laboratories capable of doing water quality testing One is operated in Belize City by the Ministry of Health and the second is operated by WASA on site at the Belize City water treatment facility Both laboratories are capable of doing complete series of physical, chemical and bacteriological tests

The Ministry of Health is responsible of ensuring safe water quality and quantity to the population, advising on appropriate location of wells and laboratory testing In practice, the task is limited only to monitoring the quality of the rural public water supply, which includes handpumps and rudimentary water systems, while WASA does sampling of municipal water systems

Water quality screening procedures are regularly conducted countrywide and monthly reports are submitted to the Senior Public Health Inspector The procedures have been reinforced lately since the appearance of the first case of cholera in February 1992 The public health inspectors carry out chemical tests in the field, while samples for bacteriological analysis (including Moore

Swab Technique specific for cholera) are transported from the different districts on a regular basis to the central laboratory at Belize City In the urban centres, routine sampling is done for chlorine residue

The main problem faced is the difficult access to some of the rural areas, especially in the Toledo District Therefore, transportation is a major limitation for the public health inspectors

The MOH, through the Rural Water Supply and Sanitation Programme acts as an advisory body in regards to the decisions for the location of well-sites prior to the actual digging by WASA

Sanitation

In 1991, 46% of the population had access to adequate sanitation facilities through the sewerage system, septic tanks and ventilated improved pit latrine (VIP) and the remaining 54% still relied on unimproved sources

Only two municipalities in the country have piped sewerage with treatment provided by WASA --Belize City and Belmopan In 1991, 18% of the population was served by this system

The use of ventilated improved pit latrines (VIP) is still limited, but the technology is easily adaptable to local conditions In 1991, 11% of the population benefitted from a VIP latrine

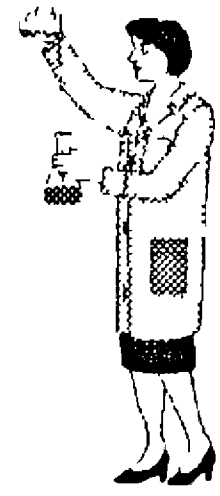
The use of septic tanks is difficult to determine The 1991 figures show that approximately 17% of the population utilizes septic tanks

In the rural areas, those without access to basic sanitary facilities use open pit latrines that are usually but not always enclosed In the urban areas, it is still very common to use buckets and eventual disposal in canals or drainage ditches (Figure 26)

Food Sanitation

Food Sanitation is one of the mandatory programmes of the Public Health Bureau of the Ministry of Health and is geared at prepared and unprepared foods The Public Health Inspectors screen shop counters, restaurants and street vendors Expired, blown, dented, or unlabelled goods, as well as foods that are contaminated or prepared/displayed under unsanitary conditions are condemned and ceased The Central Medical Laboratory has the facilities to carry out bacteriological studies on food samples suspected to be contaminated This is done upon request of the Public Health Bureau

6. Issues in Nutrition and Health of the People



- Discrepancies for some indicators have been shown between the official figures and specific studies Moreover, data gaps can be identified in the medical information system and it must be emphasized that although a vast amount of information is collected it is not always oriented towards an efficient use of the information

- The southern districts of Toledo and Stann Creek consistently appear to show the higher occurrence of health related problems, such as malnutrition, iron and zinc deficiency, diarrhoea and respiratory disease in children, low institutional deliveries, poor postpartum care coverage, and anaemia in pregnant women, and poor sanitation conditions

- Although there has been a decreasing trend in infant and child mortality, especially due to a decrease in infectious diseases, the main contributors-conditions originating in the perinatal period --respiratory diseases and diarrhoeal diseases--have remained These conditions, particularly diarrhoeal disease, acute respiratory infections and prematurity affect and may aggravate the nutritional status of children and vice versa

- There is a problem of malnutrition affecting the children in the country Overall, 25% of children under five years that attended clinics were suffering from some degree of undernutrition The Toledo District had the highest percentage of undernourished children (45 3%) On the other hand, 20% of the children in the Belize District had mild or moderate obesity and 1 4% were obese

- A high percentage of children between three and eight years of age are affected by specific micronutrient deficiencies such as vitamin A and zinc The ethnic groups most affected were the Garifuna, Maya-Kekchi and East Indian This may be related to poor dietary patterns and/or increased prevalence of infections

- Anaemia is considered a major problem in pregnant women Approximately 40% of antenatal patients were found to have values of Haemoglobin below normal The districts with highest prevalence were Cayo and Toledo

- In the past decade, chronic diseases, including heart, cerebrovascular and hypertensive diseases persistently appear as the main causes of death in Belize Other nutrition related chronic diseases such as cancer and diabetes were within the first ten causes of death Expressed as a percentage of total mortality, chronic diseases showed an increase of approximately 10% in a ten-year period (27% in 1988 versus 17% in 1978)

- In terms of hospitalization, an indirect indicator of general morbidity, nutrition related non-communicable diseases such as endocrine/metabolic and hypertensive/heart diseases, appear among the main causes for 1990 and 1991

- There are no child spacing services within the government institutions

7. Recommendations to Improve the Nutrition and Health of the People of Belize

- ✓ To strengthen and improve the medical information system in order to fill the identified gaps and improve the efficient and timely generation and use of information

- ✓ To improve the availability and accessibility of health care services, especially for mothers and children in priority areas with particular reference to the Toledo District Child spacing services should be provided as part of the regular health system

- ✓ To develop and strengthen programs that will focus on the preventive/curative measures that address the problem of chronic diseases, e g , hypertension and heart disease, diabetes, cerebrovascular disease These should include educational programs, particularly for school age children

- ✓ Organize effective educational campaigns supported by policy development so that basic nutritional practices, including breastfeeding and weaning, are improved

- ✓ Special attention should be provided to micronutrient deficiencies such as iron and vitamin A It is therefore recommended that iron supplementation for pregnant women be evaluated, and other long term interventions such as food fortification to address the problem of iron and vitamin A deficiency be considered

- ✓ To strengthen the nutrition unit with trained staff, appropriate infrastructure and budgetary allocation so as to develop an effective machinery for the purpose of planning and evaluation of nutritional programs

- ✓ To improve the coverage of water and sanitation services, in particular for the Toledo and Stann Creek Districts

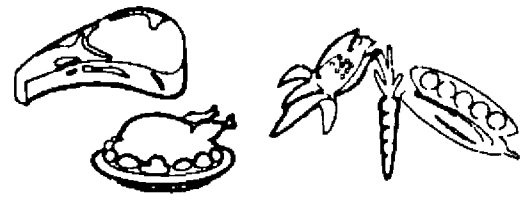
- ✓ To conduct a weight-for-height survey in the Toledo District, in order to identify the exact extent of malnutrition

B. Food Situation in Belize - A Nutrition and Health Perspective

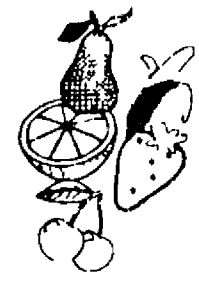
Food supply in Belize is a function of food imports and domestic food production Domestic food production is influenced by the government's socioeconomic and labour policies and a demand for certain locally grown commodities to fill the ethnic market needs Economic policies to support export crop development, for foreign exchange earnings and employment creation, stimulated farmers and labour to shift from food crop production to the more lucrative export crop production This in itself creates a further dependence on food imports The policy to make basic food commodities available to consumers at affordable prices, through price controls and subsidies, creates disincentives for domestic food production further fuelling the food import bill Cheap food policies are distinct features of Third World countries where labour rates are low and capital accumulation occurs Low agricultural labour rates pushes labour outside of the agricultural sector to more lucrative sectors, and simultaneously forces agricultural labour to get involved in food crop production to supplement their incomes Farmers involved in food crop production will grow those commodities which fit neatly into the dietary and consumption patterns of the population and will automatically find a market

The quantity and quality of imported food items and locally grown crops are based mainly on socioeconomic considerations and have little, if any, direct relationship to nutrition and health implications The government, as a measure of food security, is encouraging the attainment of self-sufficiency in the domestic production of basic food items such as rice, maize, beans, root crops, vegetables and fruits The diversified production of these commodities in a farming systems approach at the individual farm level will not only stabilize incomes but will also provide a balanced level of nutrition The provision of good quality nutritious food items, supported with suitable nutrition and health education programmes and proper food quality and safety controls, will allow Belizeans with adequate income to consume well balanced and nutritious meals and to exercise healthy lifestyles There is a need for better

coordination among the Ministries of Agriculture and Fisheries, Commerce and Trade, Health, Education and Social Development to implement suitable food, nutrition and health education programmes and to enact necessary legislations and to enforce such legislations, especially regarding food quality and safety An integrated approach to rural development must be adopted to provide the proper environment (infrastructure, amenities, and backup services) to encourage farmers to stay on the land and produce, store, process and market food items for consumers and provide an acceptable standard of living for their families



1 National Food Availability



National food availability is herein described as the sum of net imports, net farm production, and home production Net imports represents total imports less re-exports and in 1990 (Table 72) amounted to $63 3 million BZ, accounting for 27 4% of national food availability Net farm production is the difference between total farm production and exports and amounted to $48 9 million BZ or 21 2% of national food availability in 1990 Home production represents production from households whose major purpose of agricultural production was for home use This is the largest component of national food availability (valued at $231 million BZ) and accounts for $118 8 million BZ or 51 4% of national food availability This means that production at the subsistence level is responsible for feeding a large segment of the population, especially in the rural areas where wages tend to be lower and ethnic diets persist "Food from animals" is the largest food group ($113 2 million BZ) in national food availability and is followed at a distance by "staples" ($42 million BZ) and then "vegetables" ($26 8 million BZ) which implies that Belizeans are heavy consumers of animal products

a) Production

Agriculture production in Belize is highly export crop oriented, although policies are in place to encourage the production of food crops for domestic consumption in an effort to reach self-sufficiency in basic food items Agriculture diversification programmes are also being carried out to identify new crops for export, commodities for import substitution, and commodities which can be processed for local consumption and for the export market

b) Farm Production

Farm production involves commercial and/or semicommercial activities to produce commodities for the export trade and also for domestic consumption and processing Commodities include rice, maize, R K Beans, swine, milk, poultry, beef, bananas, oranges, grapefruit, sugar and fish products (Table 73) Belize is relatively self-sufficient in maize, beans, fresh pork, fresh milk, poultry and beef There is a serious ongoing effort to bring rice production to self-sufficiency levels and to export any surplus thereafter Rice acreage has fallen from 9,811 acres in 1981 (23 9 million pounds of paddy) to 5,195 acres in 1987, mainly due to decreasing prices for rice and removal of machinery subsidies, and is now climbing back up the ladder to 9,177 acres in 1991 (10 6 million pounds of paddy) (Table 73 and Figures 27 and 28) Unfavourable weather conditions also affected production levels and yields of rice, which is the chief staple crop Maize acreage and maize yield have shown some fluctuations over the past ten years but have managed to keep supplies close to demands There was a bumper crop in 1991 resulting in 70 million pounds of maize (Table 73 and Figures 29 and 30) Maize is used mainly for animal feeds with a small portion used for human consumption R K Beans have demonstrated quite

large fluctuations in acreage and in yields (less so in acreage) and this is due mainly to unstable weather conditions (Table 73 and Figures 31 and 32) There was a peak production in 1989 (9 3 million lb) but due to poorly developed storage technologies surplus production at harvest is always exported to be followed with imports to meet domestic demand R K Bean is a favoured commodity in Belizean cuisine Shortfalls in these three basic commodities (rice, maize and beans) are readily filled by timely importations Fresh pork, milk and poultry meat showed an upward trend in production (Table 73 and Figures 33 to 37) while beef production showed periods of gluts and shortages (Table 73, and Figures 38 and 39) Cattle production was affected mainly by unstable market and prices while there was always a need to import green legs and hams in preparation for the Christmas season Banana production and acreage was at a low ebb during the first half of the 1980's but saw welcomed increases in acreage and production during the latter part of the 1980's (Table 73, and Figures 40 and 41) There was a peak production of 1 4 million boxes in 1989 with falling off in production in 1990 and 1991 due to bad weather and disease problems There is always abundant rejected bananas from the export trade which can be better utilized

Citrus (oranges and grapefruit) acreages and production have demonstrated a rapid upward beat during the second half of the 1980's but have shown some decline in yields during 1991, mainly due to unfavourable weather conditions Most of the citrus is processed into concentrates and exported, with little sold on the local market (Table 73 and Figures 42 to 45) Sugarcane acreage remained rather stable except for a small period from 1984 to 1989, which was also reflected in the yield of sugar (Table 73, and Figures 46 and 47) In 1991, sugarcane is showing a return to acreage and yield experienced in the early 1980's Although fish products have experienced regular fluctuations in production over the past ten years, the increasing market prices for marine products have resulted in a favourable upward trend in fisheries export valve (Table 73 and Figure 48)

Lucrative prices in the international markets have caused the maximum allowed exportation of prime fisheries products (lobster, prawn, conch and favoured fin fish species --snappers, groupers and mackerels) leaving the less favoured species (grunts, parrot fish, and hog fish) in an undersupplied domestic market Efforts are being directed at diversifying the catch and at aquaculture to make more fish products readily available to Belizeans at reasonable prices

Rice is grown throughout the country of Belize, but mostly in the Toledo and Orange Walk Districts on milpa and mechanized production systems In 1990, Toledo leads in milpa rice production (Table 74), while Orange Walk leads in mechanized rice production Maize and R K Beans are also grown in all Belize Districts, but mainly in the two northern districts and the Cayo District Toledo has a fair acreage of milpa maize but is not mechanized for maize nor bean production (i e , a large number of milpa farmers)

Pigs are reared throughout the country but more heavily in the Cayo, Orange Walk and Corozal Districts Toledo has a fair number of pigs, but those pigs are reared on open range under poor management conditions Fresh milk production is found in the Cayo, Corozal and Orange Walk Districts Poultry and egg production is fairly concentrated in the Cayo, Orange Walk and Corozal Districts (Table 75) Although beef cattle are reared throughout the country, the animals are concentrated in the Orange Walk, Cayo and Belize Districts Bananas are grown mainly in the Stann Creek and Toledo Districts, while citrus is grown chiefly in the Stann Creek and Cayo Districts, and sugarcane in the northern districts of Orange Walk and Corozal

c) Home Production

This refers to production done on subsistence farms or plots chiefly for home consumption by household members Any surplus production is sold on the local market This type of production mainly supplements the income of low wage earners, and information of this type of production is rarely available, except in cases where surveys are carried out, such as the 1990 Household Expenditure Survey which is quite infrequent Home production includes items such as milk, beef, pork, poultry and game meat in the "food from animals" group, and maize, rice, and beans in the "staples" group, all of which are part of ethnic dishes and vary according to the ethnic and/or cultural group involved For example, East Indians grow more cereals and grains while Garifunas grow more root crops and tubers Home production information on a regular basis is very important, since home production accounts for 51 4% of the national food availability and is also responsible for major consumption patterns of Belizeans, especially the poor rural farmers and workers

d) Imports

Food imports is the second largest component of the national food availability after home production and is very important in terms of the types and quantities of food items being imported For example, "food from animals" is responsible for 31 62% of total food imports in 1990 (Table 75) while "staples" accounted for 18 69% of food imports Large amount of funds are expended on imports of those two food groups ($22 3 million BZ on "food from animals" and $13 2 million BZ on "staples") and it is important to know whether import substitution activities can take place

In the area of "staples" (Table 76), along with wheat for flour production, rice and maize are still being imported, despite local production, while a large volume of potato (over 4 5 million) pounds valued at over $2 7 million BZ) is also imported A quite large volume of R K beans, other peas and beans are being imported under the "legumes and nuts" category (Table 77), suitable varieties of which may be grown locally Fruits and juices being imported include apples and grapes, dried fruits, pineapple juices and other fruit juices (Table 78) In the "vegetables" group (Table 79), prominent on the list are onions ($998,000 BZ), other vegetables prepared or preserved otherwise ($1 1 million BZ) and other sauces and mixed seasonings ($1 5 million BZ) for 1990 Import of foods from the animal category (Table 80) includes pork salted or in brine ($1 4 million BZ), hams ($1 4 million BZ), sausages ($1 0 million BZ), other prepared meats ($1 1 million BZ), milk and cream (over $8 million BZ), and cheese and curd ($3 3 million BZ) There is considerable room for import substitution through increased local production of similar items Lard features high($3 million BZ in 1990) in imported fats and fat substitutes (Table 81), and needs to be replaced with healthier alternatives Coffee and flavouring preparations for beverages are also outstanding in the import bill (Table 82)

Despite the fact that food imports as a percentage of total imports have been decreasing over the years, from 19 57% in 1986 to 16 51% in 1990, the value of food imports have been steadily increasing, from $43 million BZ in 1986 to $63 million BZ in 1990 Food imports need to be considered carefully, not only in terms of import substitution and foreign exchange savings, but also in terms of nutrition and health aspects

e) *Per Capita Food Availability and Consumption*

Although in 1990 national food availability was valued at $231 million BZ (Table 72), this does not mean that food was readily and equally available to all Belizeans at any time Actual food availability for the individual consumer is dependent on factors such as geographic location (urban or rural), age, family size, income, food prices and other factors that may be influenced by culture and ethnicity Cultural factors and ethnicity will directly influence the types, quality (degree of preparation), and quantities of food consumed, as well as timing (spatial distribution) of intake, since it may be affected by religious and other types of festivities

National *per capita* food availability was estimated in $1252 99 BZ per annum This varies considerably from food group to food group (Table 72) For example, *per capita* availability for the "food from animals" group was 2 7 times higher ($613 90 BZ) than that for the "staples" food group ($227 90 BZ) While in 1990 other groups in descending order were $145 30 BZ for "vegetables", $58 22 BZ for "legumes and nuts", $56 60 BZ for "fats and fat substitutes", $55 83 BZ for "miscellaneous", $53 97 BZ for "fruits" and $41 27 BZ for "mixed food groups (others)" This provides a good idea of the relative availability of the various food groups and the related importance in the dietary patterns of the Belizean people

Prices may be the single most important determinant affecting the food availability to consumers This may be followed closely by location and location related factors The supplies control (prices) regulations No 30 of 1987 was enacted to control the maximum wholesale and retail prices of some imported and locally produced commodities, deemed essential, such as flour, rice, beans and sugar Those commodities that are price controlled show very little, if any, differences in prices within individual commodities from district to district (Tables 83 and 84) This may be due to transportation costs, as in the case of flour which is $ 47/lb in Belize City compared to $0 50/lb in Punta Gorda White sugar is $0 33/lb in Belize City, the point of distribution, compared to $0 39/lb in Punta Gorda, the farthest distance away Commodities which are not price controlled and produced in rural areas tend to be highest in retail prices in Belize City, as opposed to the District Towns For example, pork chops and T-bone steak tend to be cheaper in Toledo $2 64 and $3 30 per lb, respectively, and most expensive in Belize City ($5 19 and $4 76 per lb, respectively) This may be explained in grounds of demand and supply, along with transportation and other added costs related to the points of production, import and distribution

Actual food acquisition is determined by food availability, food prices and purchasing power Food purchasing power is affected by income, prices, food availability, expenditure on non-food commitments, bargaining ability and the degree to which priority is given to food acquisition, since it may be influenced by education and other socioeconomic factors Food intake or food consumption is in turn influenced by food acquisition, family size, and cultural patterns Family size itself determines the level of expenditure on food and the amount of food individuals will consume in the family In some families consumption is determined by size, age or pecking order and this may vary between ethnic groups Cultural patterns, as related to ethnicity and lifestyles, may be influenced by education and socioeconomic considerations, directly impact the level of food purchases, food production, quality, quantity, degree of preparation, and frequency of food intake

The value of total food consumed in 1990 in Belize, obtained from food expenditure and home consumption figures (Table 85) was estimated at $226 million BZ, slightly lower than the value of national food availability estimated at $231 million BZ, which indicates that there was some

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Although in 1990 national food availability was valued at $231 million BZ (Table 72), this does not mean that food was readily and equally available to all Belizeans at any time Actual food availability for the individual consumer is dependent on factors such as geographic location (urban or rural), age, family size, income, food prices and other factors that may be influenced by culture and ethnicity Cultural factors and ethnicity will directly influence the types, quality (degree of preparation), and quantities of food consumed, as well as timing (spatial distribution) of intake, since it may be affected by religious and other types of festivities

National *per capita* food availability was estimated in $1252 99 BZ per annum This varies considerably from food group to food group (Table 72) For example, *per capita* availability for the "food from animals" group was 2 7 times higher ($613 90 BZ) than that for the "staples" food group ($227 90 BZ) While in 1990 other groups in descending order were $145 30 BZ for "vegetables", $58 22 BZ for "legumes and nuts", $56 60 BZ for "fats and fat substitutes", $55 83 BZ for "miscellaneous", $53 97 BZ for "fruits" and $41 27 BZ for "mixed food groups (others)" This provides a good idea of the relative availability of the various food groups and the related importance in the dietary patterns of the Belizean people

Prices may be the single most important determinant affecting the food availability to consumers This may be followed closely by location and location related factors The supplies control (prices) regulations No 30 of 1987 was enacted to control the maximum wholesale and retail prices of some imported and locally produced commodities, deemed essential, such as flour, rice, beans and sugar Those commodities that are price controlled show very little, if any, differences in prices within individual commodities from district to district (Tables 83 and 84) This may be due to transportation costs, as in the case of flour which is $ 47/lb in Belize City compared to $0 50/lb in Punta Gorda White sugar is $0 33/lb in Belize City, the point of distribution, compared to $0 39/lb in Punta Gorda, the farthest distance away Commodities which are not price controlled and produced in rural areas tend to be highest in retail prices in Belize City, as opposed to the District Towns For example, pork chops and T-bone steak tend to be cheaper in Toledo $2 64 and $3 30 per lb, respectively, and most expensive in Belize City ($5 19 and $4 76 per lb, respectively) This may be explained in grounds of demand and supply, along with transportation and other added costs related to the points of production, import and distribution

Actual food acquisition is determined by food availability, food prices and purchasing power Food purchasing power is affected by income, prices, food availability, expenditure on non-food commitments, bargaining ability and the degree to which priority is given to food acquisition, since it may be influenced by education and other socioeconomic factors Food intake or food consumption is in turn influenced by food acquisition, family size, and cultural patterns Family size itself determines the level of expenditure on food and the amount of food individuals will consume in the family In some families consumption is determined by size, age or pecking order and this may vary between ethnic groups Cultural patterns, as related to ethnicity and lifestyles, may be influenced by education and socioeconomic considerations, directly impact the level of food purchases, food production, quality, quantity, degree of preparation, and frequency of food intake

The value of total food consumed in 1990 in Belize, obtained from food expenditure and home consumption figures (Table 85) was estimated at $226 million BZ, slightly lower than the value of national food availability estimated at $231 million BZ, which indicates that there was some

surplus/carry-over stocks to 1991 National *per capita* food consumption was established at $1,225 89 BZ per annum, with $1,381 25 for rural ares and $1,124 24 for urban areas The values for *per capita* food consumption per district varies considerably with Cayo being the highest ($1,715 23) followed by Belize ($1,231 22) and Corozal ($1,095 04) Stann Creek was the lowest ($918 24), with Toledo slightly higher ($1,042 46) and then Orange Walk ($1,051 50) This may be due to cheaper and more abundant foods in the Cayo District related to the point of production but also due to greater home production and possibly better income This may serve as a good indicator of "hotspots" for malnutrition and anemia

Per capita food availability and consumption figures by nutrients --calories, protein and fat-- are not available at this time, but steps must be taken to determine those values and also to establish a minimum nutrient requirements food basket to maintain good health and high productivity at the work place

2. Marketing and Distribution

Efficiencies in the marketing and distribution of food items are key factors affecting the final price to consumers and access to good quality foods by the poor and needy The marketing and distribution channels for imported food items are well established and perfected over the years under the mercantile trade The marketing and redistribution of locally grown food stuffs is not well organized, highly inefficient, and requires serious attention, in particular, as it affects perishable commodities and small farmer welfare The marketing of rice and maize is much better organized, since there are identified rice and feed mills which would purchase those commodities The marketing and distribution channels for other food crops are woefully lacking and this affects prices, quality, quantities, and consumer access to those food items, particularly roots and tubers, vegetables and fruits It is necessary to properly identify buying/ collection centres where food crops can be sold and purchased and moved efficiently from glut areas to areas of scarcity These centres must be equipped with proper storage with cooler/ refrigeration, transportation and handling facilities, and backed up with efficient staff with current market intelligence information There is need for additional investments in new and improved drying and storage facilities for grains and for on-farm drying and storage units for small farmers to reduce harvest losses and to command a better price at the time of sale of his produce With proper marketing and distribution channels more consumers would gain ready access to good quality food at reasonable prices, while the farmer would also benefit from increased sales and income

3. Issues in Food Availability, Marketing and Distribution, Food Acquisition and Consumption

- There is a need for a conscious, well planned, and comprehensive food and nutrition policy assigning responsibilities to the various sectors --Agriculture and Fisheries, Trade and Commerce, Health, Education and Social Development This will call for changes in labour policies, and channelling/redirecting investments and other resources to implement such a policy

- A well established database is required at the initiation of implementing the food and nutrition plan, against which new and continuous information and data will be measured in the monitoring and evaluation of food and nutrition programmes and related activities

- The proper execution of a fully integrated plan should make nutritious foods readily available to educated consumers at affordable prices to develop a well balanced plan of nutrition and good health, while simultaneously providing a fair return to farmers on their investments to allow better standards of living

4. Recommendations

✓ In the long-term, a food basket and minimum nutrient requirements should be established, and adjustments in wage rates must be made to allow consumers the purchasing power to acquire the minimum food basket

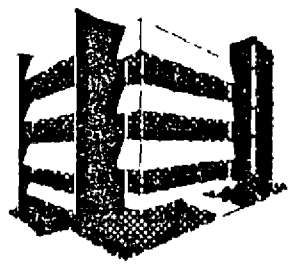
✓ Agriculture should increase the supply of rice, legumes and nuts, fruits, vegetables (especially green leafy vegetables), root crops and tubers (a source of complex carbohydrates), and fish products for local consumption

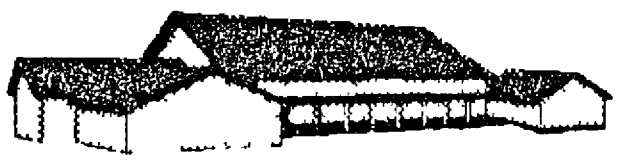
✓ Adjustments must be made in the trade and marketing environment to allow for better pricing efficiencies of food commodities to satisfy both producers and consumers

✓ Food and nutrition education programmes must be set in motion to sensitize consumers to purchase those good quality products which are nutritious and will bring about balanced diets and healthy bodies

✓ Social development must set up activities in the area of income generation projects, especially those in agro-processing, for better nutrition and health

C. Support of Social Sectors to Improve the Food, Nutrition and Health of the People of Belize





1. Formal Education

The National Paper on Education Policy states that "The Ministry of Education, on behalf of the Government of Belize, is charged with the responsibility of ensuring that all Belizeans are given the opportunity to acquire the knowledge, skills and attitudes required for full and active participation in the development of the nation and for their own personal development In carrying out this task, the Ministry, in partnership with the churches and other voluntary agencies, aims to ensure that there exist adequate support systems for the delivery of appropriate and equitable educational services The cooperative involvement of all educational agencies is crucial to the success of the Government's policy on education"

The government bears most of the cost to provide formal education Most of the schools in Belize are managed by various churches, but financially assisted by the State, hence the term "Church-State System"

The Government contributes substantially to the construction, furnishing and maintenance of school buildings and is responsible for the management of the national education system,

sharing this responsibility with churches of diverse denominations, especially in regards to primary and secondary education

The main categories serviced by the central administration includes the following

- Preschool, primary, secondary and tertiary education
- Curriculum development
- Special education
- Technical vocational education
- Adult and continuing education

For the purpose of the National Food and Nutrition Assessment, a brief description of the situation of primary and secondary education follows, emphasizing "food and nutrition education" and its role in the context of formal education in Belize The following information was mainly obtained through the review of existing data and interviews to those persons relevant to the subject

a) Primary level

Within the policy framework regarding primary education, it is stated that for several decades now, primary education has been compulsory for children between the ages of six to 14 years The 1991 Education Act retains the law, lowers the compulsory age to five and facilitates enforcement through the appointment of School Attendance Officers

Enrollments

There seems to be a general decline in the enrollment figures within the last 15 to 20 years in comparison to UNESCO Report of 1964, which shows enrollment figures of 96% of the total school age population for 1962

In the 1980's, enrollment figures seem to have gradually increased from 81% in 1980 to 90% in 1991 (Table 86)

By district, the total primary school enrollments vary from 92 2% in the Belize District to the lowest of 82 3% in Corozal All six districts show a higher percentage of males enrolling in primary school than females (Table 87)

Facilities

In 1984, there were 225 primary schools in Belize 24 government and 201 government-aided (Church/State) In 1991, there was a total of 236 primary schools 32 Government and 204 Government-aided As can be noted, in a period of approximately seven years the number of primary schools have had an increase of 11 schools (Table 88)

With the exception of Belize, there is a significantly higher number of schools in the rural areas in all districts, but no significant difference in the increase of schools by urban and rural distribution

Pupil/Teacher Ratio

Since 1965, the number of teachers has been steadily increasing The percentage of trained teachers has improved significantly from 14% in 1965 to approximately 52% in 1991 As can be observed, there still remains a need to train a significant proportion of teachers (48%) Nevertheless, the increase in teachers has had little effect on the pupil/teacher ratio, decreasing slightly to 26 1 in 1991 (Table 89)

b) Secondary Education

Only about half of those students who complete primary school actually go on to high school

Enrollments

In 1990 there was a total of 7,904 secondary school enrollments, of which 3,618 (45 8%) were in Belize District There is a slightly larger proportion of females enrolled in the secondary high schools of Belize, except in the case of the Orange Walk District where the male/female ratio is 1 09 (Table 90)

Facilities

Up to 1990, Belize had a total of 29 secondary schools (Junior Secondary and High Schools), which admit children who have completed primary school and passed a qualifying examination Of these, 10 are Government schools and the remaining 19 are denominational or community colleges built by the Government but managed by a Board of Directors (Table 91)

Pupil/Teacher Ratio

The overall pupil/teacher ratio for secondary schools is 14 0, with the lowest ratio 12 8 observed in the Stann Creek District, and the highest 19 3 in the Toledo District Belize District, which concentrates the largest number of pupils and teachers had the second lowest pupil/ teacher ratio 13 3 (Table 92)

Food and Nutrition Education

Through education in food and nutrition it is expected that individuals, families and communities learn to use their own skills and techniques to produce a change in attitudes which is necessary to adequately produce, store, prepare, select and consume the foods that are vital and important for appropriate body functions

Education as an intervention has a long-term effect, therefore, introducing food and nutrition education at an early age will help children appreciate the role that food plays in their daily lives as they grow

The integration of food and nutrition education at the primary level is probably the best strategy, and at the same time important and necessary, since for many children, formal education begins and ends in the primary schools, as can be clearly observed with the situation outlined above, which indicates that only half of those primary school graduates go on to secondary school

There is no available data on the nutritional status of school age children, but what is available is indicating some specific nutrient deficiencies such as vitamin A and iron Iron deficiency certainly will have an impact on the child's school productivity This indicates a need to improve the nutritional status of children through the identification of parallel interventions to education that will produce results in a short/medium term period
There is not a Nutrition Syllabus per se in the Curriculum for Teachers, but nevertheless nutritional aspects are addressed through different channels, such as School Health Education Programmes (SHEP), Relevant Education for Agriculture and Production Project (REAP), Home Economics, Science and Early Childhood Programmes

REAP is a compulsory course for all first year students Home Economics is an elective course offered in the first year and includes topics on the nutritional value of foods The Syllabus for General Science and Early Childhood also includes topics related to nutrition to a lesser degree

School Health Education Programme (SHEP)

SHEP was initiated as a project and began its integration process into the educational system through regional two-day workshops throughout the country to introduce the SHEP curriculum at the infant, junior and senior level, covering the eight years of primary school

The Project was monitored and assessed for two years until it came to an end in 1990, when it was handed over to the Ministry of Education (MOE) During the semi-evaluation after two years of SHEP implementation, it was found that "food and nutrition" was one of the three components taught most in the schools, "personal hygiene" and "environmental health" were the other two

All schools received two or three sets of curriculum guides, two sets of resource booklets for each component and 25 posters with messages for all five components to be used as teaching aids

Relevant Education for Agriculture and Production Project (REAP)

It was considered by educators that basic education was not meeting local needs, that integration of the different subjects in the curriculum content was lacking, the method of teaching needed improvement and most important of all, there was a need to develop a positive attitude towards agriculture

In 1975, educators, representatives of the MOE, Agriculture and Social Services, U S Peace Corps, Heifer Project International and CARE met to discuss the development of a pilot project that would have agriculture as its basis, aimed at stimulating agricultural awareness and increase knowledge, skills and attitudes of the students in the rural primary schools

In September 1976, the Relevant Education for Agriculture and Production Project (REAP) began in eight pilot project schools Currently, REAP is in 65 primary schools, whereby seven are urban Two officials from the Ministry of Education are dedicated full-time to REAP related activities In 1978, the curriculum was set up at the Teachers' College and in-service training was also integrated This was supported by the following resources

- An integrated curriculum guide
- Teacher's in-service guide
- A health and nutrition manual for Belize

The integrated curriculum focused around 10 REAP areas of study

- ❑ Land and water
- ❑ Health and nutrition
- ❑ Ecology
- ❑ Village study
- ❑ Soil
- ❑ Plants
- ❑ Animals
- ❑ Weather
- ❑ Agricultural practices
- ❑ Career education

Some of the problems found throughout the development and implementation process includes insufficient staff, inadequate supervision and the lack of policy to implement the REAP curriculum in REAP designated schools, which affects the sustainability of these efforts

The Document entitled "Staff Appraisal Report, Belize, Primary Education Development Project" of October 1991, acknowledges the existing problems in curriculum application and development which in general terms are the following

- ➧ Curriculum guides need to be reviewed and updated
- ➧ The science curriculum needs to be reviewed in order to integrate health, agriculture, and environmental studies curricula
- ➧ Training and dissemination activities for the familiarization of the curricula have not been implemented at the required level to ensure that the curricula are followed in primary school teaching

Lastly, the Report states "The MOE needs to develop a policy for curriculum development and for training teachers to use its curriculum guide"

The Belize College of Agriculture

This tertiary level governmental institution is administered under the Ministry of Agriculture and Fisheries Policies governing the College are determined by an appointed Board of Directors

It delivers an Associate Degree Course which covers a total of nine subject components over a two-year period The main objective is to provide technical qualifications and character attributes who can succeed in careers in the agricultural sectors as technicians, managers and farmers

During the first year, the course components are oriented towards basic crop production, such as maize, bean, sugar cane, rice, vegetable/root crop and coffee and cacao, livestock/animal husbandry and harvest technology

As can be noted, nutrition is not an emphasis in this agricultural oriented course

2. Issues in Formal Education

- The Draft Education Policy does not address food and nutrition as a major component of the primary school curriculum
- Health and nutrition is not recognized or emphasized within formal education
- Lack of incorporation of the SHEP and REAP programmes into the general primary education curriculum due to the trend to focus on examinable subjects
- Lack of training and motivation of teachers to implement the food and nutrition component of the health curriculum
- Literacy is a major determinant in defining education interventions and currently, there is no official position concerning the literacy rate

3. Recommendations

- ✓ Include food and nutrition as a major component of the Draft Education Policy
- ✓ Sensitize education officers and local managers as to the importance of food and nutrition within the formal education
- ✓ Include food and nutrition as an examinable subject in the Belize National Selection Examination
- ✓ Provide regular training to teachers on food and nutrition and motivate their interest in this topic
- ✓ Determine the literacy rate by districts

4. Informal Education in Food, Nutrition and Health

Belize has a very high percentage of school dropouts from primary through secondary school level Several of these dropouts are addressed through other alternatives which are considered as informal education Although health education is included in the curricula through the SHEP Programme, there is no functional system in place to monitor it and the majority of schools do not follow the programme Currently, nutrition education is being directly or indirectly addressed through several informal settings as will be outlined below

a) Youth Training Programmes

The Ministry of Social Development is responsible to carry out programmes for youths who are school dropouts or who were not able to go on to high school for financial or academic reasons Among these are

The National 4-H Training Centres

A three-month residential courses for boys and girls are conducted at these centres and includes agriculture, leadership, health --in which nutrition is included--, and small business development skills An average of 15 youths per training course are benefitting from nutrition education Specifically, this component deals with food groups, meal planning and preparation, as well as backyard gardening This exposes 60 youths per year to certain basic information on nutrition, which it is hoped they can use during and after the program

The Listowell Boys Training School

It is a residential training institution for boys between the ages of 15 and 20 years and includes poultry, vegetable production, cattle/dairy and cattle rearing along with a basic school curriculum This programme exposes boys between the ages of 10-16 years to the production of nutritious foods, however the value of these foods is not taught Since this institution is conducive to the teaching of basic nutrition, this topic can easily be integrated into the curriculum

The Youth Development Centre

This centre initiated operations in 1979 and it is agriculturally orientated Vegetable production and animal husbandry is emphasized It also includes vocational skills such as woodwork, plumbing, electrical installation and block-making

Currently, the centre has 19 students, however its capacity is 36 The trainees are selected throughout the country after completion of an application form and an interview with personnel of the Department of Social Development The trainees are generally primary school leavers who cannot afford high school education

The training at the Belize Youth Centre takes one year, including eight weeks of practical work in the field with agencies involved in agricultural work

Although the Youth Development Centre is agriculturally oriented, there is no provision of the syllabus to teach nutrition What the trainees plant in the garden plot is part of their diet, however they are not taught the nutritional value of foods This may be attributed to the fact that staff is not trained in nutrition, and secondly, nutrition is traditionally seen as a subject to be taught to girls The nutritional values of the food they produce in the garden plot can become a part of integrated teaching

Young females have expressed the desire to be enrolled at the Belize Youth Development Centre and this is being considered by the Ministry If girls are admitted, nutrition could be included as part of the curriculum

b) Home Economics Programme

The Department of Women's Affairs addresses nutrition in two of its programmes, the Home Economics Programme and the Child Development Project

The former is implemented in all districts, benefiting an average of 50 girls from urban and rural areas who participate in learning about food groups, nutritional value, and food preparation

The Child Development Project deals with factors contributing to the total development of children, nutrition is a main component Mothers in each district, especially in the rural areas, learn about nutrition which includes food groups, the importance of preparing nutritious foods and the positive effect over child development Women are also involved in practical demonstrations and preparation of balanced meals This training in nutrition benefits not only children but the family as well, since mothers are the providers of food in the household This training has also resulted in the establishment of early stimulation centres Parents and teachers are encouraged to provide nutritious snacks to the children

c) Maternal and Child Health Programme

The Ministry of Health has a programme in health education implemented mainly through the Health Education and Community Participation Bureau (HECOPAB) This organization has undertaken several activities related to nutrition education

Among the objectives of the Maternal and Child Health Plan is the importance of promoting good maternal and child nutrition HECOPAB's contribution to the improvement of mother and child nutrition is through

- Production and distribution of nutrition related health education materials
- Promotion via radio of the importance of good nutrition
- Conducting talks to schools and other social groups

The distribution process afforded approximate estimations that were given to each district However, supporting nutrition information is distributed to the general public on a walk-in basis At the same time, each district health centre receives a package of produced materials and reorders as necessary They distribute them as they feel appropriate

In an effort to strengthen the coordination between HECOPAB and non governmental organizations, some materials are distributed through other organizations such as the Breast is Best League, who also advocates for women and child nutrition

The promotion of the importance of good nutrition is also carried out via short radio programmes such as Cherish Health, and Nutrition Tips The topics generally discussed are

- Milk and the role it plays on child growth and development
- Breastfeeding, its contribution to child nutrition
- Understanding good nutrition
- Nutrition and exercise
- Obesity
- Good nutrition as opposed to bad nutrition

School talks are given on a continuous basis to various schools in Belize City on adolescent and child nutrition At the same time, nutrition talks are held for primary schoolchildren at least twice a month by health educators in the districts During the last year, two one-month courses were held with social groups, these included women of the Belize Rural Women's Association who work as community and development workers in Belize City, and the women's group of the Department of Women Affairs Topics for the training session were on the importance of proper nutrition for women and children, and eating cost-effectively to promote good nutrition

It may be concluded that nutrition education, although being addressed through informal education, requires more careful attention

Existing programmes have potential for improvement and other agencies could be encouraged to include a nutrition component into their programmes More coordination and participation will definitely improve the nutritional standards

5. Issues in Informal Education

- Inadequate coordination between the Ministries of Social Development, Health and Agriculture, regarding their Food and Nutrition Programmes

- Existing programmes are geared towards food production without emphasizing its nutritional value

6. Recommendation

- ✓ Upgrade the implementation of existing programmes in order to link food production with its nutritional value

D. Food Habits, Preparation and Consumption Patterns in the Districts

Belize's multi-ethnic society consists of five major groups These include the Creoles, Garifuna, Mestizos, Maya (Kekchi and Mopan) and East Indians Each ethnic group has its own food habits and patterns, and there are differences among them all over the country providing a spicy variety The following paragraphs describe the foods consumed and preparation methods The information presented is of descriptive nature since quantitative data on the types and amounts of food consumed in the households is not available

Rice, beans and maize are staple foods that form part of the basic diets of most of the population, although the specific combinations with other foods for various dishes varies in each ethnic group Legumes, food from animals, and fats are also common part of the diet, while fruits and vegetables take lesser importance

Corozal District

The Corozal district is composed of five major ethnic groups namely Creoles, Mestizos, East Indian, Garifuna and Maya

The Creoles are fond of "boil up", which consists of boiled plantain, cocoa, sweet potato, cassava, potato, eggs, pig-tail and fish, dressed with a tomato sauce fried in coconut oil They also eat rice and beans with stew chicken (seasoned and stewed in lard/oil and includes potatoes) and fried plantain The plantain is also fried with lard/oil or shortening When analyzed according to food groups, it shows that this group consume food from animals, mainly chicken and pork, fats, one type of vegetable, legumes and cereals

Mestizos eat *escabeche* which is an onion soup which contains either baked or fried chicken and is eaten with corn tortilla Another popular dish, the *relleno* which is also a soup, consisting of chicken stuffed with beef and pork meat, boiled eggs and tomato Food groups used are food from animals, vegetables, staples and fats

The Mayas' food is mainly corn tortilla with black beans, pepper and tomatoes Their diet therefore consists of mainly staples, legumes and one type of vegetable

Garifuna eat mostly *serre lasus* and *matilda foot* This includes cassava, plantain, cocoa and fish *Matilda foot* is grated green plantain The Garifuna's main food is staples, food from animals and fruit

The East Indians in Corozal eat *tacarry* and *bohl-baht*, which is split peas and rice *Tacarry* is made of chicken, yellow ginger, onion, lime juice, flour and coconut oil East Indians mainly use food from animals, staples, fats and some fruit

Orange Walk

Orange Walk consists of three major ethnic groups Creoles, Mestizo and Garifuna

The Creoles eat stew beans and rice with vegetables when available, and a choice of pork, chicken, beef or fish They also eat potato salad with rice and beans In assessing it according to food groups, it shows that the main groups are legumes, food from animals, staples and to a lesser extent vegetables

The Mestizos' major foods are corn tortilla, *escabeche* which is an onion soup with fried or baked chicken, *chirmole* which is a black dinner with chicken and black/red beans and pepper Their diet is also made up of food from animals, legumes, staples, and fats

The Garifuna eat cassava bread, different ground foods and fish serre, which is mostly cassava, plantain and cocoa with fish Again, the main food groups are staples, food from animals and fats

Belize District

The largest population in the rural areas of Belize District is Creole Their major dish is rice and beans, salted meats, potato salad, plantains, Johnny cakes and Creole bread (flour, lard, salt, baking powder, coconut milk) In terms of food groups it includes staples, food from animals, fruits and fats

Urban Belize also eats rice and beans, boil up which is ground foods boiled with eggs, pig tail and fish dressed with tomato sauce fried with coconut oil They also eat stew beans and rice and pig tail, ripe plantains, cow food soup which includes plantain, potato, coco and okra, conch soup which includes coco, okra, flour, pepper Creoles eat Johnny cakes, Creole bread and fried Jacks The main ingredients of the fried Jacks are flour, lard, salt, baking powder and coconut milk The fried Jacks, with the same supplies, are fried in fat while the bread and the Johnny cakes are baked

Looking at these main foods one can again list the food groups used legumes, staples, food from animals, fats and some vegetables

Cayo District

The major ethnic group in the Cayo district is the Mestizo They eat a variety of dishes such as *enchiladas*, which is a corn tortilla roll with tomato sauce, boiled egg, cheese and pepper, *empanadas* are made out of corn, beans/meat fried in deep fat and served with an onion/cabbage sauce, *chili con carne*, which has meat, pepper and beans, *garnachas* which is fried corn tortilla with beans, cheese and onion sauce, *relleno* is a black soup with chicken stuffed with beef and pork meat, boiled eggs and tomato, *tamales*, also made of corn, chicken, tomato and sweet pepper and is wrapped in banana leaf to be cooked *Arroz con pollo* is a dish that includes rice, carrots, cabbage, sweet pepper, onions, fried and mixed with the rice and shredded chicken *Ducunu* is made of young corn, butter, sweet pepper, ground, mixed and then cooked in the corn lead *Escabeche* is onion soup with chicken either baked or fried

By grouping these foods we find out that the Mestizos eat staples, legumes, vegetables, food from animals and fats

Stann Creek District

The Stann Creek district is mainly composed of Garifuna and Maya population

The Garifuna eat *serre* served with *mushla* which is a ripe banana or plantain porridge and *hudut* which is mashed plantain Cassava bread or chips are served with the meals Dumplin is also eaten, this is made of flour Garifuna drink a lot of herbal tea The Garifuna main diet consists of staples

The Maya eat stew chicken seasoned with oregano, *culantro*, basil and thyme They eat it with corn tortilla and pepper The Mayas drink corn porridge and eat ground foods where the skin is not peeled but only scraped They also eat cooked fish which is seasoned with salt and pepper *Caldo* is another of their foods, this is a soup with cocoa and pork or chicken Main food groups used are food from animals, staples, herbs and fats

Toledo District

In the Toledo district there are five major ethnic groups Garifuna, Kekchi, Creole, Mestizo, and East Indian

The Garifuna eat cassava, fish, chicken, ground foods and rice Almost everything cooked has coconut milk or oil They also eat pineapple Major food groups are food from animals, staples, fruits and fats

The Kekchi eat chicken, pork, game meat in *caldo* which is a soup with the meat seasoning and oil They eat corn, sugar cane, pepper and like lots of sugar in their drinks Kekchi use food from animals, staples and fruits

Creoles eat rice, beans and chicken Most of their foods include coconut milk They like to drink soft drinks such as coke, fanta, etc They use staples, legumes, food from animals and fat in their diet

Mestizos eat mostly food made from corn, beans, flour tortillas, pepper, chicken, pork and beef Major food groups are staples, food from animals and legumes

East Indians use *cuhun* cabbage, rice, ground food, flour tortillas, bread and tomato in their diets Basically their diet consists of food from animals, staples and one type of vegetable

E. Issue in Food Habits

- There is a lack of information on food consumption at the household level

F. General Reccomendations

- Develop and establish a National Food and Nutrition Policy
- Appoint a multisectoral food and nutrition task force to develop a national food and nutrition plan and to monitor the implementation of planned activities
- Establish a secretariat within a designated ministry to coordinate and support the activities of the food and nutrition multisectoral task force
- Establish and implement a national food and nutrition information system and database to support the national plan
- Update the nutrition curriculum of the School Health Education Programme, and integrate food and nutrition components into the curriculum of all teaching institutions
- Strengthen the existing information systems in the various sectors in order to fill the gaps identified in the present assessment
- Promote public communication programmes to inform and sensitize the population regarding appropriate food consumption
- Adopt an integrated approach to rural development for an improved food, nutrition and health status particularly in the Belize, Stann Creek and Toledo Districts
- Sensitize and train key personnel from the different sectors in food and nutrition
- Conduct a survey on food consumption at the household level

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TABLES

TABLE 1

BELIZE
POPULATION BY DISTRICT 1991

Area	1991
COUNTRY	
TOTAL	189,392
Urban	90,005
Rural	99,387
COROZAL	
TOTAL	28,464
Corozal Town	7,062
Rural	21,402
ORANGE WALK	
TOTAL	30,681
Orange Walk Town	11,014
Rural	19,667
BELIZE	
TOTAL	57,000
Belize City	44,087
San Pedro Town	1,849
Rural	11,094
CAYO	
TOTAL	37,693
Belmopan	3,558
Benque	3,580
San Ignacio/Santa Elena	8,962
Rural	21,593
STANN CREEK	
TOTAL	18,085
Dangriga	6,435
Rural	11,650
TOLEDO	
TOTAL	17,439
Punta Gorda	3,458
Rural	13,981

Source 1991 Population Census, C S O

TABLE 2

BELIZE
POPULATION BY SEX AND AGE GROUP 1991

Age Group	1991					
	Total	%	Male	%	Female	%
COUNTRY						
TOTAL	189,392	100 0	96,325	100 0	93,067	100 0
0-4	30,415	16 1	15,487	16 1	14,928	16 0
6-14	52,686	27 8	27,046	28 1	25,640	27 6
15-24	37,815	20 0	18,745	19 5	19,070	20 5
25-34	26,941	14 2	13,930	14 5	13,011	14 0
35-44	16,051	8 5	8,150	8 5	7,901	8 5
45-54	9,471	5 0	4,817	5 0	4,654	5 0
55-64	7,556	4 0	3,853	4 0	3,703	4 0
65 PLUS	8,457	4 5	4,297	4 5	4,160	4 5
URBAN						
TOTAL	90,005	100 0	44,412	100 0	45,593	100 0
0-14	13,045	14 5	6,662	15 0	6,383	14 0
6-14	23,389	26 0	11,991	27 0	11,398	25 0
15 24	18,457	20 5	8 882	20 0	9,575	21 0
25-34	13,501	15 0	6,662	15 0	6,839	15 0
35-44	8,100	9 0	3,997	9 0	4,103	9 0
45-54	4,501	5 0	2,221	5 0	2,280	5 0
55-64	4,055	4 5	1,776	4 0	2,279	5 0
65 PLUS	4,957	5 5	2,221	5 0	2,736	6 0
RURAL						
TOTAL	99,387	100 0	51,913	100 0	47,474	100 0
0-14	17,370	17 5	8,825	17 0	8,545	18 0
6-14	29,297	29 5	15,055	29 0	14,242	30 0
15-24	19,358	19 5	9,863	19 0	9,495	20 0
25-34	13,440	13 5	7,268	14 0	6,172	13 0
35-44	7,951	8 0	4,153	8 0	3,798	8 0
45-54	4,970	5 0	2,596	5 0	2,374	5 0
55-64	3,501	3 5	2,077	4 0	1,424	3 0
65 PLUS	3,500	3 5	2,076	4 0	1,424	3 0

Source 1991 Population Census, C S O

TABLE 3

MORTALITY RATES IN CHILDREN UNDER FIVE YEARS
BELIZE 1969 - 1989

Year	Infant *	Neonatal *	1-4 Years
1969	47 2	21 9	4 6
1970	51 2	20 2	4 2
1971	30 9	-	-
1972	34 0	-	-
1973	41 7	-	-
1974	42 5	-	3 5
1975	42 6	-	-
1976	45 1	-	-
1977	40 0	-	-
1978	39 9	-	-
1979	37 8	-	-
1980	28 7	12 1	-
1981	27 5	14 1	-
1982	22 9	11 0	2 1
1983	23 2	10 3	1 3
1984	26 2	12 9	2 2
1985	20 6	13 7	1 5
1986	23 1	11 7	1 4
1987	20 7	11 6	1 4
1988	20 2	14 9	1 4
1989	19 4	-	1 5
1990	22 5	-	-

* Rate per 1,000 live births

Source CELADE, 1988, Statistical Abstracts, 1980-1989, OPS, 1980-1987, Ministry of Health, 1990

TABLE 4

TRENDS IN INFANT MORTALITY RATE BY DISTRICT
BELIZE 1983 - 1990

District	1983	1984	1985	1986	1987	1988	1989	1990
Corozal	20 0	19 2	11 7	14 2	26 1	17 5	20 8	23 1
Orange Walk	14 3	11 7	18 1	12 0	11 6	20 0	13 4	15 4
Belize	32 0	25 7	26 7	35 2	24 3	25 2	25 3	29 5
Cayo	16 3	18 9	12 9	13 2	15 5	15 4	13 2	15 6
Stann Creek	25 3	40 5	24 8	34 4	28 0	19 0	18 5	20 2
Toledo	21 5	56 3	26 0	21 2	20 6	19 0	21 8	27 8

Source Abstracts of Statistics 1983 - 1990

TABLE 5

PRINCIPAL CAUSES OF DEATH, UNDER ONE YEAR
BELIZE 1988

Code	Cause	No	Rate	%
45	Certain conditions originating in the perinatal period	66	9 7	46 8
32	Other diseases of the respiratory system	25	3 7	17 7
44	Congenital Anomalies	10	1 5	7 1
46	Signs, symptoms and ill-defined conditions	9	1 3	6 4
19	Nutritional deficiences	7	1 0	5 0
	Other causes	23	3 4	16 3
	Total	141	20 7	100

Source Medical Statistical Office
Rate/1000 live births

TABLE 6

INFANT MORTALITY RATES

1991 CENSUS DATA
(DEATHS PER 1,000 LIVE BIRTHS)

District	No. of Deaths
Belize District	23
Cayo	31
Corozal	37
Orange Walk	34
Stann Creek	43
Toledo	54
Belize National Rate	35

Source 1991 Population Census, Central Statistical Office

TABLE 7

NUMBERS AND RATES OF NEONATAL DEATHS PER DISTRICT IN 1991

District	Live Births	Neonatal Deaths	Rate**
Belize	2397	71	29 6
* Belmopan/		15	
* San Ignacio	1040	12	25 9
Corozal	515	4	7 7
Orange Walk	1064	9	8 4
Stann Creek	500	10	20 0
Toledo	602	4	6 6
Country	6118	125	20 4

* Cayo District
** Neonatal Deaths/1,000 Live Births

Source Moguel A Maternal and Child Mortality Study 1991

TABLE 8

MAIN CAUSES OF NEONATAL DEATHS IN BELIZE
1991

Cause	No of Deaths	%
Respiratory Distress	25	20 0
Prematurity	18	14 4
Congenital Abnormalities	17	13 6
Sepsis	12	9 6
Hypoxia	9	7 2
Aspiration	8	6 4
Asphyxia	7	5 6
Respiratory Arrest	7	5 6
Cardiac Failure	6	4 8
* Others	16	12 8
Total	125	100

*	Anoxia	4	Traumatic Delivery	1
	Bronchopneumonia	3	Pulmonary Haemorrhage	1
	Intracrania Haemorrhage	2	Acid Basic Disorder	1
	Hypothermia	1	Gastro-enteritis	1
	Entero Colitis	1	Acute Anaemia	1

Source Moguel A Maternal and Child Mortality Study, 1991

TABLE 9

CHILD MORTALITY ONE TO FOUR YEARS PER DISTRICT
BELIZE 1991

District	No of Deaths	Population 1-4 yrs	Child Mortality Rate
Belize	18	6,063	2 9
*Belmoplan/ San Ignacio	8 6	4,854	2 9
Corozal	6	3,587	1 7
Orange Walk	3	4,063	0 7
Stann Creek	6	2,269	2 6
Toledo	3	2,790	1 1
Country	50	23,626	2 1

* Cayo District.

Source Moguel A Maternal and Child Mortality Study 1991.

TABLE 10

MAIN CAUSES OF DEATHS IN CHILDREN ONE TO FOUR YEARS IN 1991

Cause	No of Deaths
Respiratory Disease	14
Dehydration	12
Cerebral infection/ irritation	7
Abornalities	5
* Others	12
TOTAL	50

*	Sepsis	4
	Accidents	4
	Malnutrition	2
	Leukaemia	1
	Septic Arthritis	1

Source A Moguel, Maternal and Child Mortality 1991

TABLE 11

DISTRIBUTION OF THE NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS OF AGE
BY NUTRITIONAL CATEGORY AND DISTRICT
BELIZE JANUARY-MARCH 1992

National Group	District						
	Corozal	Orange Walk	Belize	Cayo	Stann Creek	Toledo	Country
Severe Malnutrition	27 (1 8)	7 (0 6)	26 (1 1)	33 (1 4)	11 (1 8)	8 (2.2)	112 (1 3)
Moderate Malnutrition	78 (5 1)	65 (5 5)	69 (2.0)	121 (5 1)	36 (5 8)	49 (13 3)	418 (4 9)
Mild Malnutrition	360 (23.7)	277 (23.6)	304 (12 4)	476 (20 0)	104 (16 8)	110 (29 8)	1,631 (19 2)
Normal	885 (58 3)	687 (58 6)	1,531 (62 4)	1,420 (59 6)	351 (56 7)	171 (46 3)	5,045 (59 2)
Low Risk of Obesity	125 (8 2)	93 (7 9)	366 (14 9)	250 (10 5)	85 (13 7)	26 (7 0)	945 (11 1)
High Risk of Obesity	25 (1 6)	38 (3 2)	124 (5 1)	62 (2 6)	25 (4 0)	3 (0 8)	277 (3 3)
Obesity	18 (1 2)	5 (0 4)	34 (1 4)	22 (0 9)	7 (1 1)	2 (0.5)	88 (1 0)
Total	1,518 (100 0)	1,172 (100 0)	2,454 (100 0)	2,384 (100 0)	619 (100 0)	369 (100 0)	8,516 (100 0)

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize January - March 1992

TABLE 12

DISTRIBUTION OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS BY NUTRITIONAL CATEGORY AND AGE GROUP, BELIZE COUNTRY JANUARY-MARCH 1992

Nutritional Groups	Age Group					
	less than 6 months	6-11 months	12-23 months	24-35 months	36-59 months	Total
Severe Malnutrition	17 (15 2)	23 (20 5)	36 (32 1)	10 (8 9)	26 (23 2)	112 (100 00)
Moderate Malnutrition	40 (9 6)	86 (20 6)	139 (32 1)	86 (20 6)	67 (16 0)	418 (100 0)
Mild Malnutrition	154 (9 4)	303 (18 6)	568 (33 3)	280 (17 2)	326 (20 0)	1,631 (100 0)
Normal	1,362 (27 0)	1,123 (22 3)	1,158 (23.0)	654 (13 0)	748 (14 8)	5,045 (100 0)
Low Risk of Obesity	427 (45 2)	180 (19 0)	186 (19 7)	95 (10 1)	57 (6 0)	945 (100 0)
High Risk of Obesity	127 (45 8)	51 (18 4)	58 (20 9)	21 (7 6)	20 (7 2)	277 (100 0)
Obesity	47 (53 4)	8 (9 1)	20 (22 7)	5 (5 7)	8 (9 1)	88 (100 0)
Total	2,174 (25 5)	1,774 (20 8)	2,165 (25 4)	1,151 (13 5)	1,252 (14 7)	8,516

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize January - March 1992

TABLE 13

DISTRIBUTION OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS
BY NUTRITIONAL CATEGORY AND AGE GROUPS, COROZAL DISTRICT
JANUARY - MARCH 1992

Nutritional Groups	Age Group					
	less than 6 months	6-11 months	12-23 months	24-35 months	36-59 months	Total
Severe Malnutrition	5 (15 2)	7 (25 9)	8 (29 6)	2 (7 4)	5 (18 5)	27 (100 0)
Moderate Malnutrition	6 (7 7)	9 (11 5)	29 (37 2)	18 (23 1)	16 (20 5)	78 (100 0)
Mild Malnutrition	35 (9 7)	53 (14 7)	123 (34 2)	68 (18 9)	81 (22 5)	360 (100 0)
Normal	204 (23 1)	174 (19 7)	184 (20 8)	132 (14 9)	191 (21 6)	885 (100 0)
Low Risk of Obesity	52 (41 6)	23 (18 4)	28 (22 4)	11 (8 8)	11 (8 8)	125 (100 0)
High Risk of Obesity	9 (36 0)	4 (16 0)	5 (20 0)	3 (12 0)	4 (16 0)	25 (100 0)
Obesity	9 (50 0)	0 (0 0)	7 (1 8)	0 (0 0)	2 (0 6)	18 (100 0)
Total	320 (21 1)	270 (17 8)	384 (25 3)	234 (15 4)	310 (20 4)	1,518 (100 0)

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize January - March 1992

TABLE 14

DISTRIBUTION OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS BY NUTRITIONAL CATEGORY AND AGE GROUPS, ORANGE WALK DISTRICT JANUARY - MARCH 1992

Nutritional Groups	Age Group					
	less than 6 months	6-11 months	12-23 months	24-35 months	36-59 months	Total
Severe Malnutrition	1 (14 3)	0 (0 0)	5 (71 4)	0 (0 0)	1 (14 3)	7 (100 0)
Moderate Malnutrition	1 (1 5)	20 (30 8)	25 (38 5)	12 (18 5)	7 (10 8)	65 (100 0)
Mild Malnutrition	16 (5 8)	47 (17 0)	113 (40 8)	52 (18 8)	49 (17 7)	277 (100 0)
Normal	120 (17 5)	137 (19 9)	206 (30 0)	105 (15 3)	119 (17 3)	687 (100 0)
Low Risk of Obesity	29 (31.2)	21 (22 6)	24 (25 8)	11 (11 8)	8 (8 6)	93 (100 0)
High Risk of Obesity	13 (34 2)	3 (7 9)	10 (26 3)	7 (18 4)	5 (13.2)	38 (100 0)
Obesity	2 (40 0)	0 (0.0)	3 (60 0)	0 (0 0)	0 (0 0)	5 (100 0)
Total	182 (15 5)	228 (19 5)	386 (32 9)	187 (16 0)	189 (16 1)	1,172 (100 0)

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize. January - March 1992

TABLE 15

DISTRIBUTION OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS
BY NUTRITIONAL CATEGORY AND AGE GROUPS, BELIZE DISTRICT
JANUARY - MARCH 1992

Nutritional Groups	Age Group					
	less than 6 months	6-11 months	12-23 months	24-35 months	36-59 months	Total
Severe Malnutrition	3 (15 2)	9 (34 6)	7 (26 9)	1 (3 8)	6 (23 1)	26 (100 0)
Moderate Malnutrition	15 (21 7)	15 (21 7)	21 (30 4)	8 (11 6)	10 (14 5)	69 (100 0)
Mild Malnutrition	47 (15 5)	78 (25 7)	86 (28 3)	42 (13 8)	51 (16 8)	304 (100 0)
Normal	501 (32 7)	381 (24 9)	341 (22.3)	161 (10 5)	147 (9 6)	1,531 (100 0)
Low Risk of Obesity	172 (47 0)	78 (21 3)	68 (18 6)	32 (8 7)	16 (4 4)	366 (100 0)
High Risk of Obesity	57 (46 0)	31 (25 0)	22 (17 7)	7 (5 6)	7 (5 6)	124 (100 0)
Obesity	15 (44 1)	6 (17 6)	7 (20 6)	4 (11 8)	2 (5 9)	34 (100 0)
Total	810 (33 0)	598 (24 4)	552 (22 5)	255 (10 4)	239 (9 7)	2,454 (100 0)

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize January - March 1992.

TABLE 16

DISTRIBUTION OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS BY NUTRITIONAL CATEGORY AND AGE GROUPS, CAYO DISTRICT JANUARY - MARCH 1992

Nutritional Groups	Age Group					
	less than 6 months	6-11 months	12-23 months	24-35 months	36-59 months	Total
Severe Malnutrition	5 (15.2)	6 (18 2)	7 (21 2)	6 (18 2)	9 (27 2)	33 (100 0)
Moderate Malnutrition	8 (6 6)	28 (23 1)	30 (24 8)	32 (26 4)	23 (19 0)	121 (100 0)
Mild Malnutrition	27 (5 7)	80 (16 8)	162 (34 0)	86 (18 1)	121 (25 4)	476 (100 0)
Normal	299 (62.8)	306 (64 6)	358 (56 3)	208 (55 9)	249 (58 5)	1,420 (100 0)
Low Risk of Obesity	99 (39 6)	43 (17 6)	57 (22 8)	35 (14 0)	16 (6 4)	250 (100 0)
High Risk of Obesity	26 (41 9)	9 (14 5)	19 (30 6)	4 (6 5)	4 (6 5)	62 (100 0)
Obesity	12 (54.5)	2 (9 1)	3 (13 6)	1 (4 5)	4 (18 2)	22 (100 0)
Total	476 (20 0)	474 (19 9)	636 (26 7)	372 (15 6)	426 (17 9)	2,384 (100 0)

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize January - March 1992

TABLE 17

DISTRIBUTION OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS BY NUTRITIONAL CATEGORY AND AGE GROUPS, STANN CREEK DISTRICT JANUARY - MARCH 1992

Nutritional Groups	Age Group					
	less than 6 months	6-11 months	12-23 months	24-35 months	36-59 months	Total
Severe Malnutrition	3 (27 3)	1 (9 1)	4 (36 4)	0 (0 0)	3 (27 3)	11 (100 0)
Moderate Malnutrition	6 (16 7)	10 (27 8)	7 (19 4)	5 (13 9)	8 (22 2)	36 (100 0)
Mild Malnutrition	23 (22 1)	24 (23 1)	25 (24 0)	15 (14 4)	17 (16 3)	104 (100 0)
Normal	165 (47 0)	69 (19 7)	38 (10 8)	38 (10 8)	41 (11 7)	351 (100 0)
Low Risk of Obesity	53 (62 4)	13 (15 3)	8 (9 4)	6 (7 1)	5 (5 9)	85 (100 0)
High Risk of Obesity	19 (76 0)	4 (16 0)	2 (8 0)	0 (0 0)	0 (0 0)	25 (100 0)
Obesity	7 (100 0)	0 (0 0)	0 (0 0)	0 (0 0)	0 (0 0)	7 (100 0)
Total	276 (44 6)	121 (19 5)	84 (13 6)	64 (10 3)	74 (12 0)	619 (100 0)

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize January - March 1992

TABLE 18

DISTRIBUTION OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS BY NUTRITIONAL CATEGORY AND AGE GROUPS, TOLEDO DISTRICT JANUARY - MARCH 1992

Nutritional Groups	Age Group					
	less than 6 months	6-11 months	12-23 months	24-35 months	36-59 months	Total
Severe Malnutrition	0 (0 0)	0 (0 0)	5 (62 5)	1 (12 5)	2 (25 0)	8 (100 0)
Moderate Malnutrition	4 (8 2)	4 (8 2)	27 (55 1)	11 (22 4)	3 (6 1)	49 (100 0)
Mild Malnutrition	6 (5 5)	21 (19 1)	59 (53 6)	17 (15 5)	7 (6 4)	110 (100 0)
Normal	73 (42 7)	56 (32 7)	31 (18 1)	10 (5 8)	1 (0 6)	171 (100 0)
Low Risk of Obesity	22 (84 6)	2 (7 7)	1 (3 8)	0 (0 0)	1 (3 8)	26 (100 0)
High Risk of Obesity	3 (100 0)	0 (0 0)	0 (0 0)	0 (0 0)	0 (0 0)	3 (100 0)
Obesity	110 (29 8)	0 (0 0)	0 (0 0)	0 (0 0)	0 (0 0)	2 (100 0)
Total	218 (59 1)	83 (22 5)	123 (33 3)	39 (10 6)	14 (3 8)	369 (100 0)

Source A review of growth monitoring data in children less than 5 years in Health Centers of Belize January - March 1992

TABLE 19

MALNUTRITION IN CHILDREN UNDER FIVE YEARS
IN BELIZE BY DISTRICT USING GOMEZ CLASSIFICATION
1981

District	Percentage of Malnutrition
Corozal	6 9
Orange Walk	6 1
Belize	3 9
Cayo	6 5
Stann Creek	7 6
Toledo	15 5
Total	6 2

Source Caribbean Food and Nutrition Institute

TABLE 20

BELIZE: PERCENTAGE OF CHILDREN UNDER FIVE YEARS OF AGE REPORTED TO HAVE HAD DIARRHOEA DURING THE TWO WEEKS PRIOR TO INTERVIEW, BY RESIDENCE, YEARS OF EDUCATION AND AGE OF CHILD 1991 FAMILY HEALTH SURVEY

Age of Child	Total		Residence			
			Urban		Rural	
Total	10 8	(2,179)	9 9	(1,219)	12 2	(960)
0-5 months	10 4	(232)	11 0	(136)	9 2	(96)
6-11 months	18.6	(213)	23 9	(108)	12 8	(105)
1 year	11 0	(486)	15 5	(260)	21 3	(226)
2 years	11 0	(412)	8 7	(227)	14 1	(185)
3 years	5 9	(422)	4 5	(257)	8 1	(165)
4 years	3 1	(414)	2 5	(231)	3 9	(183)

Source Belize Family Health Survey, 1991

TABLE 21

BELIZE. PERCENTAGE OF CHILDREN UNDER FIVE YEARS OF AGE REPORTED TO HAVE HAD DIARRHOEA DURING THE TWO WEEKS PRIOR TO INTERVIEW, BY ETHNIC GROUP AND AGE OF CHILD
1991 FAMILY HEALTH SURVEY

Age of Child	Total		Ethnic Group							
			Creole		Mestizo		Garifuna		Maya/Kekchi	
Total	10 8	(2,179)*	7 5	(572)	12 3	(1,032)	7 7	(199)	15 2	(259)
0-5 months	10 4	(232)	25 4	(61)	13 5	(105)	**	(22)	11 8	(30)
6-11 months	18 6	(213)	23 5	(56)	16 5	(100)	**	(17)	17 7	(30)
1 year	18 1	(486)	9 5	(122)	20 8	(233)	14 0	(48)	31 7	(53)
2 years	11 0	(412)	5 3	(103)	14 9	(212)	6 4	(39)	11 3	(42)
3 years	5 9	(422)	6 2	(119)	4 3	(187)	2 4	(34)	10 8	(57)
4 years	3 1	(414)	0 7	(111)	4 0	(195)	4 3	(39)	5 7	(47)

* Total includes 117 cases classified as "other"
** Less than 25 cases

Note Figures in parentheses are unweighted numbers of cases

Source Belize Family Health Survey, 1991

TABLE 22

EPI COVERAGE IN PERCENTAGES
BELIZE 1989 - 1991

	1989	1990	1991
BCG	90 7	80	81
DPT 3	79 5	84	82
Polio 3	73 8	80	82
Measles	70 8	81	76

Source MCH Department, Ministry of Health

TABLE 23

NUMBER OF CASES OF EPI DISEASES IN CHILDREN UNDER AGE 5, BELIZE 1981 - 1991

Year	Diseases					
	Measles	Tuberculosis	Diphteria	Pertussis	Neonatal Tetanus	Polio
1980	607	-	-	11	-	1
1981	186	-	-	55	2	-
1982	8	-	4	-	4	-
1983	11	2	-	1	-	-
1984	4	1	-	3	-	-
1985	7	-	-	36	-	-
1986	124	-	-	8	-	-
1987	74	-	1	-	1	-
1988	19	-	-	-	-	-
1989	2	1	-	-	-	-
1990	25	1	-	3	-	-
1991	10	NA	-	4	-	-

Source EPI - Expanded Programme of Immunisation
Medical Statistics

TABLE 24

EXCLUSIVE BREASTFEEDING UP TO FOUR MONTHS BY DISTRICT, BELIZE 1991

District	No children under 1 year registered	No. children exclusively breastfed	%
Belize	2,126	407	19 1
Corozal	976	175	18 0
Orange Walk	1,159	195	17 0
Cayo	1,460	481	33 0
Stann Creek	709	273	38 5
Toledo	695	406	58 4
Total	7,125	1,937	27 2

* Expressed as a percentage of all < 1 year children attending the health services

Source MCH Report, 1991

TABLE 25

MEAN DISTRIBUTION OF HEMOGLOBIN AND HEMATOCRIT OF BELIZE CHILDREN (3-8 YRS)

Ethnic Group	Sex	Mean Hemoglobin (g/dl)	Mean Hematocrit (%)
Creole	M	11 2±1 10*	33 6±2 68
	F	11 3±0 89	33 2±2 54
	All	11 2±0 96	33 4±2 60
Mestizo	M	11.7±1 10	34 7±2 89
	F	11 7±1 20	34 5±3 10
	All	11 7±1 17	34 6±3 00
Garifuna	M	11 2±0 87	34 0±2 29
	F	10 2±1 70	32 0±3 80
	All	10 7±1 45	33 0±3 29
Kekchi Indians	M	11 5±0 91	33 7±2 37
	F	11 4±1 10	33 5±3 10
	All	11 5±0 99	33 6±2 77
E Indians	M	10 9±0 82	33 4±2 02
	F	10 8±0 96	33 2±2 67
	All	10 9±0 88	33 3±2 31

* Mean ± SD

Source Assessment of Vitamin A Status of the Children of Belize, 1989 Lincoln University

TABLE 26

PERCENTAGE OF CHILDREN WITH NORMAL AND ABNORMAL RDR TESTS (BY SEX)

RDR (%)*	Sex		
	Male	Female	All
0-10	11 7	11 7	11 7
11-20	32 7	24 2	28 1
0-20	44 4	35 9	39 8
21-30	29 4	31 4	30 5
31-40	15 4	20 2	18 0
41-50	5 6	7 3	6 5
50 and over	5 1	5 2	5 2
21 and over	55 5	64 1	60 2

Source Assessment of Vitamin A Status of the Children of Belize, 1989 Lincoln University

* RDR < 20% = Adequate vitamin A liver reserve
RDR 21 - 50% = Marginal vitamin A deficiency
RDR > 50% = Very low liver reserve

TABLE 27

PERCENTAGE OF CHILDREN WITH NORMAL AND ABNORMAL RDR TESTS (BY ETHNIC GROUP)

RDR (%)	Ethnic Group				
	Creole	E. Indian	Garifuna	Kekchi	Mestizo
0-10	10 7	9 5	13 0	3 6	16 0
11-20	33 6	31 0	19 6	10 0	33 2
0-20	44 3	40 5	32 6	13 6	49 2
21-30	35 1	23 8	37 0	14 3	32 1
31-40	16 0	23 8	17 4	27 5	12 3
41-50	3 8	2 4	4 3	21 4	5 3
50 and over	0 8	9 5	8 7	23 2	1 1
21 and over	55 7	59 5	67 4	86 4	50 8

Source Assessment of the Vitamin A Status of the Children of Belize, 1989 Lincoln University

TABLE 28

NUMBER OF NEW PRENATAL MOTHERS BY DISTRICT 1991

District	New Prenatal Mothers	Expected Pregnancies*	Percent
Corozal	868	1,209	72 0
Orange Walk	1,179	1,297	91 0
Belize	1,543	2,308	67 0
Cayo	1,426	1,552	92 0
Stann Creek	665	743	90 0
Toledo	583	743	79 0
Total	6,264	7,852	80 0

* Coverage of Prenatal Care estimated based on newly registered mothers over expected pregnancies for 1991

Source MCH Programme, Ministry of Health

TABLE 29

BELIZE. USE OF PRENATAL CARE, BY RESIDENCE AND YEARS OF EDUCATION LIVE BIRTHS WITHIN FIVE YEARS OF INTERVIEW TO CURRENTLY MARRIED WOMEN AGED 15-44 (PERCENT DISTRIBUTION)

Prenatal Care	Total	Residence		Years of Education		
		Urban	Rural	0-7	8	9+
Yes	95 5	95 9	95 1	95 5	94 5	97 3
No	4 5	4 1	4 9	4 5	5 5	2 7
Total	100 0	100 0	100 0	100 0	100 0	100 0
No of Cases (Unweighted)	(1,991)	(1,035)	(956)	(878)	(697)	(416)
Source of Prenatal Care						
Government Facility	86 9	84 7	89 3	90 3	90 1	74 3
Private Facility	12 5	14 9	9 7	8 7	9 5	25 5
Midwife/TBA	0 5	0 3	0 7	0 7	0 4	0 2
Other	0 1	0 0	0 3	0 3	0 0	0 0
Months Pregnant When First Received Care						
≤3 Months	42 8	49 1	35 6	40 0	38 1	56 4
4-6 Months	49 4	44 2	55 5	51 5	53 9	37 8
7-9 Months	4 1	3 7	4 5	4 9	4 3	1 9
Doesn't Remember	3 7	3 0	4 4	3 5	3 7	3 9
No of Prenatal Visits						
1-4	17 5	11 7	24 1	21 8	18 0	7 8
5-8	54 4	50 8	58 6	55 9	54 8	50 8
9-12	18 4	25 6	10 1	16 2	18 0	23 5
13+	3 6	6 1	0 7	1 6	2 4	9 7
Does not remember	6 1	5 8	6 5	4 6	6 8	8 2
Total	100 0	100 00	100 0	100 0	100 0	100 0
No of Cases (Unweighted)	(1,910)	(996)	(914)	(842)	(665)	(403)

Source Belize Family Health Survey 1991

TABLE 30

NUMBER AND PERCENTAGE OF DELIVERIES IN HOSPITAL AND AT HOME OR PRIVATE CLINIC BY DISTRICT, 1991

District	Hospital Deliveries	%	Home/Private Clinic Deliveries	%	Total Deliveries
Corozal	378	73 0	143	27.0	521
Orange Walk	685	64 0	387	36 1	1,072
Belize	2,300	94 0	137	6 0	2,437
Cayo/Belmopan	810	77 0	246	23 0	1,056
Stann Creek	339	66 0	173	34 0	512
Toledo	221	36 0	392	64 0	613
Total	4,733	76 0	1,478	24 0	6,211

Source MCH Programme, MOH Midwifery Report, 1991

TABLE 31

DELIVERIES AT HOME OR PRIVATE CLINIC BY TYPE OF PERSONNEL AND BY DISTRICT, 1991

District	TTBA	UTBA	NM	STM	MO	Other*	Total
Corozal	79	14	13	-	36	1	143
Orange Walk	177	156	42	-	10	2	387
Belize	59	5	21	-	52	-	137
Cayo	95	7	22	-	122	-	246
Stann Creek	60	2	19	24	-	68	173
Toledo	90	38	43	-	-	221	392
Total	560 (37 9%)	222 (15 0%)	160 (10 8%)	24 (1 6%)	220 (14 9%)	292 (19 8%)	1,478 (100%)

Source MCH Programme, Midwifery Report, 1991

* Deliveries attended in the home, health center, private clinic
TBA = Traditional Birth Attendant
TTBA = Trained Traditional Birth Attendant
UTBA = Untrained Traditional Birth Attendant
NM/STM = Nurse Midwifes/Single Trained Midwifes
MO = Private Medical Officer

TABLE 32

DELIVERIES ATTENDED BY TRADITIONAL BIRTH ATTENDANTS EXPRESSED AS A PERCENTAGE OF THE TOTAL NUMBER OF DELIVERIES BY DISTRICT 1991

District	No. of Deliveries Attended		Total	*Percent
	Trained TBA	Untrained TBA		
Corozal	79	14	93	17 5
Orange Walk	177	156	333	31 0
Belize	59	5	64	2 7
Cayo/Belmopan	95	7	102	9 7
Stann Creek	60	2	62	12 1
Toledo	90	38	128	20 9
Total	560	222	782	12 6

* Percent of total number of deliveries registered

Source MCH Programme, M O H

TABLE 33

BELIZE PERCENTAGE OF PREGNANCIES TO CURRENTLY MARRIED WOMEN AGE 15-44 WHO RECEIVED POSTPARTUM CARE AND PERCENTAGE OF CHILDREN BORN WITHIN FIVE YEARS OF INTERVIEW WHO RECEIVED A NEWBORN CHECKUP, BY SELECTED CHARACTERISTICS

Selected Characteristics	Postpartum Care*		Newborn Checkup**	
Total	40 3	(1,988)	58 0	(1,982)
Residence				
Urban	48 3	(1,035)	73 9	(1,031)
Rural	31 2	(935)	39 9	(951)
Respondent's Education (years)				
0-7	33 2	(875)	46 8	(878)
8	35 5	(697)	55 9	(695)
9+	63 5	(416)	85 2	(413)
Ethnic Group				
Creole	54 7	(436)	79 4	(434)
Mestizo	34.6	(1,024)	49 5	(1,023)
Garifuna	54 5	(158)	78 1	(158)
Maya/Kekchi	25 3	(257)	38 5	(256)
Other	49 6	(113)	67 2	(113)

* Excludes three cases for whom use of postpartum care is known.
** Excludes nine cases for whom use of newborn checkup is unknown

Note Figures in parentheses are unweighted numbers of cases

Source 1991 Family Health Survey

TABLE 34

MATERNAL DEATHS, LIVE BIRTHS (LB) AND MATERNAL MORTALITY RATE (MMR) IN BELIZE DURING THE PERIOD 1979 - 1989

Year	Number of Maternal Deaths	MMR/10,000 LB
1979	3	5 43
1980	3	4 79
1981	3	5 19
1982	3	5 12
1983	2	3 28
1984	3	4.88
1985	2	3 28
1986	4	6 47
1987	3	4 43
1988	0	0 00
1989	NA*	NA*

* NA - Not Available

Source Government of Belize, Abstract of Statistics years cited

TABLE 35

ESTIMATE NUMBER OF MATERNAL DEATHS, LIVE BIRTHS AND CORRECTED MATERNAL MORTALITY RATE (CMMR) IN BELIZE DURING THE PERIOD 1979-1989

Year	Est Number of Maternal Deaths	Number of Live Births (LE)	CMMR/10,000 LB
1979	5	5523	9 05
1980	5	6264	7 98
1981	3	5781	5 19
1982	5	5861	8 53
1983	8	6091	13 13
1984	5	6150	8.13
1985	8	6094	13 13
1986	5	6178	8 09
1987	3	6775	4 43
1988	5	7025	7 12
1989	5	6810	7 34

Source Smith, F Maternal Mortality in Belize, 1990

TABLE 36

MATERNAL MORTALITY BY DISTRICT
BELIZE 1990

District	No of Deaths	MMR*
Corozal	3	34 7
Orange Walk	2	18 1
Belize	2	8 9
Cayo	3	20 3
Stann Creek	2	28 9
Toledo	2	30 9
Total	14	19 9

* MMR per 10,000 Live Births

Source 1990 Maternal Mortality in Belize An Investigation Report, Araceli Moguel

TABLE 37

CAUSE OF MATERNAL DEATHS PER DISTRICT
BELIZE, 1990

District	Cause				
	Pulmonary Embolism	Retained Placenta	PPH	Hypertensive Disease	Others*
Corozal		1	1	1	
Orange Walk			2		
Belize				1	1
Cayo	1				2
Stann Creek	1	1			
Toledo			1		1
Total	**2**	**2**	**4**	**2**	**4**

* Others DIC
Prolonged Labor/Ruptured Uterus
Post Partum Jaundice
DIC - Abrupto Placentae

Source 1990 Maternal Mortality in Belize An Investigation Report, A Moguel

TABLE 38

NUMBER AND RATES OF MATERNAL DEATHS PER DISTRICT FOR 1991

District	Live Births	Deaths	Rate*
Toledo	602	2	33 2
Stann Creek	500	2	40 0
Orange Walk	1064	1	9 3
**Belmopan/San Ignacio	1040	-	-
Corozal	515	-	-
Belize	2397	4	16 6
Country	6118	9	14 7

* (MM/10,000 Live Births)
** Cayo District

Source A Moguel Maternal and Child Mortality Report 1991

TABLE 39

MAIN CAUSES OF MATERNAL DEATHS PER DISTRICT IN 1991

District	Cause		
	PPH	Eclampsia	Others*
Belize	-	-	4
Cayo	-	-	
Corozal	-	-	
Orange Walk	-	1	
Stann Creek	1	1	
Toledo	1	1	
Total	2	3	4

* DIC - Ectopic gestation
Pulmonary embolism
Cardiac disease
Septicaemia

Source A Moguel Maternal and Child Mortality Report 1991

TABLE 40

PREVALENCE OF ANAEMIA IN THE ANTE-NATAL CLIENTS IN BELIZE IN 1988

District/Hb Level	>=11 0 g/dl	<11 0 g/dl	<10.0 g/dl
Belize	607 (61 5%)	380 (38 5%)	149 (15 1%)
Corozal	257 (60 6%)	167 (39 4%)	79 (18 6%)
Orange Walk	463 (60 6%)	301 (39 4%)	94 (12 3%)
Cayo	514 (52 9%)	457 (47 1%)	224 (23 1%)
Stann Creek	299 (75 7%)	96 (24 3%)	32 (8 1%)
Toledo	168 (52 7%)	151 (47 3%)	70 (21 9%)
All	2308 (59 8%)	1552 (40 2%)	648 (16 8%)

Source Survey on Anaemia in Pregnant Women in 1988, MOH, Annegret Hof, MPH

TABLE 41

BELIZE
LOW BIRTH WEIGHT
BY DISTRICT 1991

District	Live Births	Number <2,500 gms	%
Corozal	515	11	2 1
Orange Walk	1064	26	2 4
Belize	2397	190	7 9
Cayo	1040	44	4 2
Stann Creek	500	20	4 0
Toledo	602	45	7 5
Total	6118	336	5 5

Source Medical Statistical Office, MOH

TABLE 42

DISTRIBUTION OF LOW BIRTH WEIGHT OF CHILDREN UNDER FIVE YEARS IN THE PERIOD JANUARY TO MARCH, 1992 BY DISTRICT

District	Percentage LBW
Corozal	9 9
Orange Walk	7 9
Belize	9 3
Cayo	6 7
Stann Creek	3 4
Toledo	12 1

Source B N A T Review of Growth Monitoring of children under 5 years of the Health Center in Belize, January to March 1992

TABLE 43

TEN LEADING CAUSES OF HOSPITALIZATION
(ACCORDING TO DIAGNOSIS)
BELIZE COUNTRY 1990-1991

Code	Causes	1990			1991		
		1990	Rate	%	1991	Rate	%
39	Direct Obstretic Causes	1289	6 8	0 68	1190	6 5	0 65
32	Other Diseases of the respiratory tract	1120	5 9	5 89	1075	5 8	0 58
38	Abortion	1001	5 3	0 53	990	5 4	0 54
34	Diseases of other parts of the digestive system	996	5 2	0 52	930	5 0	0 50
01	Intestinal Infectious Diseases	850	4 5	0 45	780	4 2	0 42
18	Endocrine and Metabolic Diseases, Immunity disorders	702	3 7	0 37	740	4 0	0 40
26	Hypertensive/Heart Diseases						
45	Certain conditions originated in the perinatal period	604	3 2	0 32	730	4 0	0 40
37	Disease of Female Genital Organs	810	4 3	0 43	630	3 4	0 34
55	Other injuries, early complications and surgical care						
47	Fractures				590	3 2	0 32
	Other Causes	806	4 2	0 42	530	2 9	0 29
	Total	790	4 2	0 42	502	2 7	0 27
		8968	47 2	4 72	8687	47 1	4 71
		10770	56 7	5 67	9342	50 7	5 07
		19738	103 9	100	18029	97 8	100

Source Medical Statistics Office

Rate/1,000 pop

TABLE 44

MORBIDITY TABLE
PRINCIPAL CAUSES OF HOSPITALIZATION
ALL AGES (ACCORDING TO DISCHARGE DIAGNOSIS)
COROZAL DISTRICT, 1989

Code	Cause	No	Rate	%
41	Normal delivery	384	13 5	25 2
39	Direct obstetric causes	117	4 1	7 7
34	Diseases of other parts of the digestive system	114	4 0	7 5
32	Other diseases of the respiratory system	111	3 9	7 3
55	Other injuries, early complications and surgical care	90	3 2	5 9
01	Intestinal infectious diseases	76	2 7	5 0
46	Sign, symptoms and ill-defined conditions	45	1 6	3 0
35	Diseases of urinary system	43	1 5	2 8
21	Mental disorders	40	1 4	2 6
47	Fractures	39	1 4	2 6
	Other causes	462	16 2	30 4
	Total	1521	53 4	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 45

MORBIDITY TABLE
PRINCIPAL CAUSES OF HOSPITALIZATION
ALL AGES (ACCORDING TO DISCHARGE DIAGNOSIS)
ORANGE WALK DISTRICT, 1989

Code	Cause	No	Rate	%
41	Normal delivery	682	23 4	33 1
46	Signs, symptoms and ill-defined conditions	179	6 1	8 7
32	Other diseases of the respiratory system	149	5 1	7 2
01	Intestinal infectious diseases	133	4 6	6 5
39	Direct obstetric causes	116	4 0	5 6
34	Diseases of other parts of the digestive system	82	2 8	4 0
38	Abortion	82	2 8	4 0
18	Endocrine and metabolic diseases, immunity disorders	65	2 2	3 2
28	Diseases of pulmonary circulation and other forms of heart diseases	59	2 0	2 9
55	Other injuries, early complications and surgical care	59	2 0	2 9
	Other causes	456	15 6	22 1
	Total	2062	70 7	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 46

MORBIDITY TABLE
PRINCIPAL CAUSES OF HOSPITALIZATION
ALL AGES (ACCORDING TO DISCHARGE DIAGNOSIS)
BELIZE DISTRICT, 1989

Code	Cause	No	Rate	%
41	Normal delivery	2012	31 5	21 8
39	Direct obstetric causes	733	11 5	7 9
34	Diseases of other parts of the digestive system	608	9 5	6 6
38	Abortion	553	8 7	6 0
32	Other diseases of the respiratory system	494	7 7	5 3
45	Certain conditions originating in the perinatal period	483	7 6	5 2
26	Hypertensive disease	414	6 5	4 5
37	Diseases of female genital organs	406	6 4	4 4
18	Endocrine and metabolic diseases, metabolic disorders	372	5 8	4 0
47	Fractures	372	5 8	4 0
	Other causes	2791	43 7	30 2
	Total	9238	144 6	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 47

MORBIDITY TABLE
PRINCIPAL CAUSES OF HOSPITALIZATION
ALL AGES (ACCORDING TO DISCHARGE DIAGNOSIS)
CAYO DISTRICT, 1989

Code	Cause	No	Rate	%
41	Normal delivery	354	12 2	36 2
39	Direct obstetric causes	68	2 3	7 0
01	Intestinal infectious diseases	46	1 6	4 7
38	Abortion	39	1 3	4 0
21	Mental Disorders	35	1 2	3 6
42	Diseases of skin and subcutaneous tissues	32	1 1	3 3
31	Diseases of upper respiratory tract	29	1 0	3 0
34	Diseases of other part of the digestive system	27	0 9	2 8
26	Hypertensive diseases	26	0 9	2 7
32	Other diseases of the respiratory system	26	0 9	2 7
	Other causes	295	10 1	30 2
	Total	977	33 6	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 48

MORBIDITY TABLE
PRINCIPAL CAUSES OF HOSPITALIZATION
ALL AGES (ACCORDING TO DISCHARGE DIAGNOSIS)
STANN CREEK DISTRICT, 1989

Code	Cause	No	Rate	%
41	Normal delivery	279	15 6	24 2
46	Signs, symptoms and ill-defined conditions	101	5 7	8 8
32	Other diseases of the respiratory system	100	5 6	8 7
01	Intestinal infectious diseases	72	4 0	6 2
38	Abortion	61	3 4	5 3
34	Diseases of other parts of the digestive system	50	2 8	4 3
55	Other injuries, early complications and surgical care	40	2 2	3 5
39	Direct obstetric causes	37	2 1	3 2
18	Endocrine and metabolic diseases, immunity disorders	30	1 7	2 6
20	Diseases of blood and blood forming organs	28	1 6	2 4
	Other causes	355	19 9	30 8
	Total	1153	64 6	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 49

MORBIDITY TABLE
PRINCIPAL CAUSES OF HOSPITALIZATION
ALL AGES (ACCORDING TO DISCHARGE DIAGNOSIS)
TOLEDO DISTRICT, 1989

Code	Cause	No	Rate	%
41	Normal delivery	210	14 3	16 1
32	Other diseases of the respiratory system	177	12 1	13 6
01	Intestinal infectious diseases	106	7 2	8 1
34	Diseases of other parts of the digestive system	95	6 5	7 3
35	Disease of urinary system	83	5 7	6 4
39	Direct obstetric causes	73	5 0	5 6
46	Signs, symptoms and ill-defined conditions	54	3 7	4 1
05	Rickettsiosis and other arthropod-borne diseases	49	3 3	3 8
38	Abortion	41	2 8	3 1
18	Endocrine and metabolic diseases, immunity disorders	37	2 5	2 8
	Other causes	377	25 7	29 0
	Total	1302	88 7	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 50

MALARIA CASES BY DISTRICT

1990 - 1991

District	No. of Cases			
	1990	Rate	1991	Rate
Belize	128	2 3	159	2 9
Corozal	449	16 0	290	10 2
Orange Walk	252	10 0	337	11 0
Cayo	1255	35 7	2019	55 3
Stann Creek	159	8 4	234	13 4
Toledo	816	47 2	667	38 1
Total	3052	16 6	3706	20 0

Source Medical Statistical Office
Ministry of Health

TABLE 51

DEATHS AND DEATH RATES* BY SEX - 1970 TO 1989

Year	Death Rates*			
	Total Death Rate	Male Death Rate	Female Death Rate	Infant Mortality Rate
1970	6 8	7 4	6 2	51.2
1971	5 1	5.7	4 6	30 9
1972	5 4	5 8	5 0	34 0
1973	6 2	6 8	5 6	41.7
1974	5 7	6 2	5 3	42.5
1975	5 7	5 8	5 5	42 6
1976	6 7	7 2	6 3	45 1
1977	5 8	6 3	5 2	40 0
1978	6 5	7 6	5 4	39 9
1979	5 1	5 4	4 9	37.8
1980	4 9	5 1	4 8	28 7
1981	4 7	5 2	4 3	27.5
1982	4 3	4 5	4 2	22 9
1983	4 6	4 9	4 2	23 2
1984	4 6	5 3	4 0	26 2
1985	4 2	4 5	3 8	20 6
1986	4 0	4 3	3 8	23.1
1987	3 9	4 2	3 7	20 7
1988	3 9	4 2	3 6	20 2
1989	4 2	4 5	3 9	19 4

* Rates are per 1,000 population of specified group

Source Registrar General's Office

TABLE 52

GENERAL MORTALITY RATES*
BY DISTRICT
BELIZE 1970, 1980 AND 1990

District	1970	1980	1990
Corozal	66	46	32
Orange Walk	48	36	32
Belize	73	66	80
Cayo	51	28	30
Stann Creek	89	44	54
Toledo	80	60	45

* Rates x 1000 Population

Source Abstract of Statistics 1991

TABLE 53

AGE SPECIFIC MORTALITY RATE*

BELIZE 1980 AND 1989

Age	Mortality Rates/1000 pop in each age group	
	1980	1989
0 - 4 years	10 8	5 5
5 - 14 years	0 4	0 5
15 - 44 years	1 5	1 5
45 - 64 years	6 1	6 8
65 years + over	29 5	31 9

* Data obtained from Abstract of Statistics 1983 and 1991

TABLE 54

PROPORTIONAL MORTALITY RATES
BY AGE GROUPS IN THE COUNTRY OF BELIZE
1981 AND 1990

Age Group	1981		1990	
	No. of Deaths	Proportional Mortality (%)	No. of Deaths	Proportional Mortality (%)
Infant	160	22 6	158	17 3
1-4 yrs	51	7.2	44	4 8
5-14 yrs	18	2 5	30	3 3
15-44 yrs	61	8 6	131	14 3
45-64 yrs	109	15 4	141	15.4
65 yrs and over	292	41.2	394	43.1
Unknown age	18	2 5	17	1 9
Total No. Deaths	709		915	

Source Abstracts of Statistics 1981 and 1990

TABLE 55

BELIZE
TABLES 3 7: TEN PRINCIPAL CAUSES OF DEATH
1983 AND 1984

Causes	1983		1984	
	Number	Rate*	Number	Rate*
Heart Diseases	120	0 8	71	0 4
Bronchitis, Emphysema & Asthma	53	0 3	69	0.4
Malignant Neoplasms	55	0 3	56	0 3
Pneumonia	51	0 3	52	0 3
All other Accidents	50	0 3	42	0 2
Cond Originating in the Perinatal Period	53	0 3	40	0 2
Cerebrovascular Disease	35	0 2	38	0 2
Bacterial Disease	25	0 1	34	0 2
Hypertension	NA	NA	27	0 1

NA - Not Applicable

* Rates are per 1,000 of population

Source Medical Statistics Office

TABLE 56

BELIZE
TEN PRINCIPAL CAUSES OF DEATH WITH RATE PER 1,000 POPULATION
FOR THE YEARS 1989 AND 1990

Cause	1989			1990		
	Rank	No	Rate	Rank	No.	Rate
Heart Diseases	1	135	0 8	1	160	0.9
Certain conditions originating in the perinatal period	2	132	0 7	2	158	0 9
Diseases of the respiratory system	3	105	0 6	3	108	0 6
All cancers	4	96	0 5	4	99	0 5
Cerebrovascular diseases	5	80	0 5	5	90	0.5
All accidents (excluding motor vehicle)	6	89	0.5	6	89	0.5
Motor vehicle accidents	7	71	0.5	7	86	0 5
Diabetes cellitus	8	80	0 4	8	70	0.4
Diseases of the digestive system	9	59	0 3	9	62	0 3
Hypertensive disease	10	60	0 3	10	60	0 3
Total Deaths		762			915	

* Rate/1,000 population

Source Hospital Death Records and District Registrar's Records

TABLE 57

CHANGING PATTERNS OF MORTALITY IN BELIZE
1976, 1986 AND 1988

Cause	% of Total Mortality		
	1976	1986	1988
Chronic Diseases *	17.9	27 5	26 9
Influenza and Pneumonia	10 8	11 0	11.7
Causes of Perinatal Mortality	5 1	6 3	8 2
Intestinal Infections	8 6	3 4	NA
Malnutrition	3 6	2 3	4 6

* Chronic Diseases - Diabetes, hypertensive disease, ischemic heart disease, cerebrovascular disease, alteroscleroso and malignant neoplasm

Sources.

(1) Health Conditions in the Americas 1973-1976 and 1990. PAHO

(2) National Health Planning System, Ministry of Health Epidemiological Surveillance Unit, 1990

TABLE 58

PRINCIPAL CAUSES OF DEATH, ALL AGES
COROZAL DISTRICT, 1988

Code	Cause	No.	Rate	%
32	Other diseases of the respiratory system	16	0 56	15 2
29	Cerebrovascular disease	12	0 42	11 4
27	Ischemic heart disease	8	0 28	7.6
28	Diseases of the pulmonary circulation and other forms of heart disease	8	0 28	7 6
18	Endocrine and metabolic diseases, immunity disorders	7	0 25	6 7
46	Signs, symptoms and ill-defined conditions	7	0 25	6.7
E47	Transport accidents	7	0 25	6 7
35	Diseases of the urinary system	5	0 18	4.8
45	Certain conditions originating in the perinatal period	5	0 18	4 8
	Other causes	30	1 05	28.6
	Total	105	3 69	100

Source: Medical Statistical Office
Rate/1000 pop

TABLE 59

PRINCIPAL CAUSES OF DEATH, ALL AGES
ORANGE WALK DISTRICT, 1988

Code	Cause	No.	Rate	%
32	Other diseases of the respiratory systems	16	0.55	14 7
28	Disease of the pulmonary circulation and other forms of heart disease	11	0 38	10 1
E52	Other accidents, including late effects	10	0 34	9.2
27	Ischemic heart disease	7	0 24	6 4
29	Cerebrovascular disease	7	0.24	6 4
09	Malignant neoplasm of digestive organs and peritoneum	6	0.21	5 5
19	Nutritional deficiencies	6	0 21	5 5
45	Certain conditions originating in the perinatal period	6	0.21	5 5
E47	Transport accidents	6	0 21	5 5
	Other causes	34	1.17	31.2
	Total	109	3.74	100

Source. Medical Statistical Office
Rate/1000 pop

TABLE 60

PRINCIPAL CAUSES OF DEATH, ALL AGES
BELIZE DISTRICT, 1988

Code	Cause	No	Rate	%
32	Other diseases of the respiratory system	35	0 55	11 5
28	Diseases of the pulmonary circulation and other forms of heart disease	31	0 49	10 2
45	Certain conditions originating in the perinatal period	29	0 45	9 6
29	Cerebrovascular disease	24	0 38	7 9
18	Endocrine and metabolic disease, immunity disorders	18	0 28	5 9
E52	Other accidents, including late effects	18	0 28	5 9
19	Nutritional deficiences	17	0 27	5 6
27	Ischemic health disease	17	0 27	5 6
26	Hypertensive disease	13	0 20	4 3
34	Diseases of other part of the digestive system	12	0 19	4 0
	Other causes	89	1 39	29 4
	Total	303	4 74	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 61

PRINCIPAL CAUSES OF DEATH, ALL AGES
CAYO DISTRICT, 1988

Code	Cause	No	Rate	%
46	Signs, symptoms and ill-defined conditions	17	0 58	13 8
32	Other diseases of the respiratory system	16	0 55	13 0
45	Certain conditions originating in the perinatal period	13	0 45	10 6
E52	Other accidents, including late effects	11	0 38	8 9
E47	Transport accidents	10	0 34	8 1
10	Malignant neoplasm of the respiratory and intrathoracic organs	6	0 21	4 9
18	Endocrine and metabolic diseases, immunity disorders	5	0 17	4 1
28	Diseases of the pulmonary circulation and other forms of heart disease	5	0 17	4 1
29	Cerebrovascular disease	5	0 17	4 1
02	Tuberculosis	4	0 14	3 3
	Other causes	31	1 06	25 2
	Total	123	4 23	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 62

PRINCIPAL CAUSES OF DEATH, ALL AGES
STANN CREEK DISTRICT, 1988

Code	Cause	No	Rate	%
29	Cerebrovascular disease	13	0 73	14 6
28	Diseases of pulmonary circulation and other forms of heart disease	12	0 67	13 5
10	Malignant neoplasm of digestive organs and peritoneum	9	0 50	10 1
18	Endocrine and metabolic diseases, immunity deficiencies	8	0 45	9 0
45	Certain conditions originating in the perinatal period	8	0 45	9 0
32	Other diseases of the respiratory system	6	0 34	6 7
27	Ischemic heart disease	5	0 28	5 6
E52	Other accidents, include late effects	4	0 22	4 5
	Other causes	24	1 34	27 0
	Total	89	4 98	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 63

PRINCIPAL CAUSES OF DEATH, ALL AGES
TOLEDO DISTRICT, 1988

Code	Cause	No.	Rate	%
46	Signs, symptoms and ill-defined conditions	11	0 75	15 1
01	Intestinal infectious diseases	7	0 48	9.6
19	Nutritional deficiencies	6	0 41	8 2
32	Other diseases of the respiratory system	5	0 34	6 8
44	Congenital anomalies	5	0 34	6 8
18	Endocrine and metabolic diseases, immunity disorders	4	0 27	5 5
34	Diseases of other part of the digestive system	4	0 27	5 5
02	Tuberculosis	3	0 20	4 1
09	Malignant neoplasm of digestive organs and peritoneum	3	0 20	4 1
27	Ischemic health disease	3	0 20	4 1
35	Diseases of the urinary system	3	0 20	4.1
	Other causes	19	1 29	26 0
	Total	73	4 97	100

Source Medical Statistical Office
Rate/1000 pop

TABLE 64

PATTERNS OF NUTRIENT AVAILABILITY IN BELIZE
1961-63 TO 1986-88

Nutrients	1961-63	1971-73	1981-83	1986-88	% Imported
Calorie (Kcal/caput/day REQ 2250 kcal	2349	2573	2656	2628	34 5
Protein gm/caput/day REQ 43 gm	63 3	63 8	67 7	70 2	35 2
Fat (Tool) gm/caput/day REQ 37 5 GM	56 1	64 3	67 6	72 9 Veg - 30% Animal - 70%	68 3
% of Total Cal REQ fat = 15%	21 5	22 5	22 9	25 0	

Source Sinha D P Changing Patterns of Food Availability in the Caribbean and their Implications for Health and Disease (under preparation)

TABLE 65

PATTERNS OF FOOD AVAILABILITY IN BELIZE
1961-63 TO 1968-88

Food Groups	% of Energy			
	1961-63	1971-73	1981-83	1986-88
Cereals REQ 40%	41 6	37 1	35 4	34 1
Roots and tubers REQ 10%	1 9	1 3	2 0	2 2
Pulses and nuts REQ 5%	4 8	5 8	5 8	4 1
Fruits and vegetables REQ 15%	9 4	8 1	7 2	9 0 <1 0 Veg 8 0 Fruit
Sugar REQ 5%	11 5	17 0	17 3	15 1
Food from animals (meat, fish, dairy, eggs) REQ 15%	16 5	17 3	18 2	19 7
Fats and oils REQ 10%	11 2	10 4	10 2	10 9

Source Sinha D P Changing Patterns of Food Availability in the Caribbean and their Implications for Health and Disease (under preparation)

TABLE 66

BASIC INFRASTRUCTURE FOR HEALTH CARE DELIVERY
BELIZE 1992

District	Health Centers	Health Posts	Hospitals	Health Centers 10,000 inhabitants
Corozal	4	-	1	1 4
Orange Walk	5	1	1	1 6
Belize	8	-	1 (Referral Hospital)	1 5
Cayo	5	2	2 (San Ignacio & Belmopan)	1 4
Stann Creek	8	3	1	4 6
Toledo	4	11	1	2 3
Total	34	17	7	1 8

Source Medical Statistical Office

TABLE 67

TOTAL NUMBER OF HOSPITAL BEDS IN THE COUNTRY OF BELIZE, GOVERNMENT AND PRIVATE, FOR ACUTE AND CHRONIC DISEASES, BY DISTRICT APRIL 1, 1992

District/Town	Government		Private		Total
	Acute	Chronic	Acute	Chronic	
Orange Walk					
Orange Walk Town	28				28
Corozal					
Corzal Town	28				28
Belize					
Belize City	180	50*			230
Mile 21¼		88**			88
Cayo					
Belmopan (Capital City)	47				47
San Ignacio	28		16	20***	64
Stann Creek					
Dangriga	47				47
Toledo					
Punta Gorda	30				30
Total	388	138	16	20	562

* Infirmary, Ministry of Social Development = 50 beds

** Rockview Psychiatric Hospital, Ministry of Health = 88 beds

*** Octavia Waight, Home for the Elderly, Helpage, Ministry of Health = 20 beds

TABLE 68

BELIZE
UTILIZATION OF IN-PATIENT SERVICES
1990

Hospital	No Disch.	No Beds	Bed Occupancy Rate
Belize City Hospital	11,104	184	75 4%
Corozal Hospital	1,434	28	41 6%
Orange Walk Hospital	1,673	28	41 9%
San Ignacio Hospital	1,025	28	21 9%
Belmopan Hospital	1,593	47	29 4%
Stann Creek Hospital	1,523	28	33 9%
Toledo Hospital	1,291	30	41 0%

Source. Health Financing and Sustainability Project, Vol V 1990

TABLE 69

RATES OF PHYSICIANS & DENTISTS (BOTH PRIVATE AND PUBLIC) BY DISTRICT BELIZE 1992

District	Physicians	Rate Physicians/ 10,000 Inhabitants	Dentists	Rate Dentists/ 10,000 Inhabitants
Corozal	12	4 2	1	0 4
Orange Walk	8	2 6	1	0 3
Belize	70	12 9	8	1 5
Cayo	14	3 8	-	-
Stann Creek	8	4 6	1	0 6
Toledo	4	2 3	1	0 6
Total	116	6 3	12	0 6

Source Medical Department

TABLE 70

RATES OF NURSING PERSONNEL BY DISTRICT
BELIZE 1992

District	Registered Nurses	Rate of Registered Nurses/10,000 Inhabitants	Auxiliary/Practical Nurses	Rate of Auxiliary/ Practical Nurses/10,000 population
Corozal	9	3 2	14	4 9
Orange Walk	10	3.3	12	4 0
Belize	51	9 4	66	12 2
Cayo	19	5 2	25	6 8
Stann Creek	8	4 5	14	8 0
Toledo	2 9	2 9	14	8 0
Total	102	5 5	135	7 3

Source A I D Proposal for a five year plan for Human Resources in Health - Belize 1991

TABLE 71

OTHER HEALTH PERSONNEL
MINISTRY OF HEALTH
BELIZE 1991

Category	Number	Rate/10,000 Population
Nutritionist	1	0 1
Health Educator	5	0 3
Lab Technicians	20	1 1
X-ray Technicians	9	0 5
Pharmacists	1	0 1
Dispensers	14	0 8
Supplies Officer	2	0 1
Public Health Inspectors	19	1 0
Vector Control Personnel	101	5 5

Source Ministry of Health

TABLE 72

NATIONAL FOOD AVAILABILITY 1990
FROM IMPORTS, FARM PRODUCTION AND HOME PRODUCTION
('000 BZ)

Food Groups	Net Imports	Net Farm Production	Home Production	Total	Per Capita Availability
1. STAPLES	$13,187	$2,795	$26,029	$42,011	0.2279
2. LEGUMES + NUTS	$2,784	$5,094	$2,855	$10,733	0.05822
3. FRUITS	$1,538	$113	$8,298	$9,949	0.05397
4. VEGETABLES	$5,344	$16,523	$4,917	$26,784	0.1453
5. FOOD FROM ANIMALS	$22,316	$18,242	$72,608	$113,166	0.6139
6. FATS + FAT SUBSTITUTE	$6,421	-	$4,013	$10,434	0.0566
7. MISCELLANEOUS	$4,112	$6,143	$37	$10,292	0.05583
8. MIXED FOOD GROUPS (OTHERS)	$7,607	-	-	$7,607	0.04127
TOTALS	$63,309	$48,910	$118,757	$230,976	1.25299
% of Total	27.41	21.18	51.41	100	

Source: Household Expenditure Survey,
Central Statistical Office.

TABLE 73

CROP AND LIVESTOCK PRODUCTION
1980 - 1991

COMMODITY	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
RICE												
'000 LBS	19,000	23,890	17,800	9,170	12,507	12,334	9,712	10,126	12,237	11,115	10,172	10,562
ACRES	8,100	9,811	8,183	5,891	6,225	6,055	5,900	5,195	6,802	6,282	5,089	9,177
CORN												
'000 LBS	41,453	46,600	46,700	38,800	35,620	43,280	40,747	51,203	50,973	41,372	41,162	70,126
ACRES	26,000	28,310	27,490	25,890	29,110	31,875	27,874	32,492	33,243	29,255	24,326	27,641
R.K.BEANS												
'000 LBS	3,073	3,809	4,030	3,372	2,834	2,343	4,008	5,325	4,927	9,280	5,660	7,027
ACRES	6,150	7,520	6,950	6,944	4,645	4,515	5,694	9,366	9,542	11,350	9,786	8,349
PIG												
NO.	6,490	5,242	5,733	5,658	6,251	6,431	6,411	8,030	8,160	8,341	11,553	8,627
LBS	487,000	365,000	332,000	495,000	589,000	662,000	642,000	844,000	915,000	1,048,239	1,430,368	1,560,803
MILK												
LBS	616,000	649,000	701,000	975,000	1,169,000	1,244,000	2,295,000	2,164,000	2,580,000	2,373,000	2,735,000	2,851,176
POULTRY												
NO '000 BRD	1,266	1,534	1,789	1,929	1,968	2,002	1,820	2,506	2,831	2,480	3,882	4,160
'000 LBS	4,305	5,216	6,060	6,477	6,672	6,757	5,626	8,686	11,120	7,402	13,489	14,384
BEEF												
NO.	6,621	6,367	6,042	5,820	6,189	7,552	7,425	8,317	7,459	6,423	7,870	7,187
LBS	2,300,000	2,216,000	1,933,000	2,100,000	2,238,156	2,721,000	2,599,000	2,923,264	2,646,127	2,108,547	3,222,292	3,119,346
BANANAS												
BOXES	784,885	549,275	523,696	530,797	554,644	506,847	695,000	1,183,475	1,394,386	1,440,099	1,337,827	1,157,220
ACRES	1,475	1,560	1,600	1,630	1,558	1,645	1,725	3,242	2,613	4,321	6,192	5,113
ORANGE												
BOXES	1,109,050	1,063,000	1,057,781	750,359	1,124,408	1,042,950	1,265,361	1,672,456	1,337,803	1,447,834	1,696,028	1,202,951
ACRES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8,953	14,664	24,007	31,162	41,126
G/FRUIT												
BOXES	408,400	586,050	702,806	178,172	317,000	475,858	649,779	905,945	840,696	889,082	1,103,211	792,245
ACRES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,192	3,441	8,340	8,811	11,930
SUGAR												
L.TONS	103,300	97,724	105,980	114,278	101,525	102,018	93,345	82,320	81,748	90,934	100,297	101,914
ACRES	61,000	61,000	62,000	61,000	59,000	58,000	52,000	55,000	58,407	58,500	58,905	60,000
FISH PRODUCTS												
LBS	1,617,043	1,757,472	1,838,092	2,130,922	1,699,026	1,655,869	1,647,803	1,985,989	1,976,632	1,658,763	1,734,861	1,839,022

Source. Ministry of Agriculture

TABLE 74

CROP AND LIVESTOCK PRODUCTION 1990
BY DISTRICT

CROPS\DISTRICTS	COROZAL	O. WALK	BELIZE	CAYO	ST. CREEK	TOLEDO	TOTALS
1. Grains, Beans & Sugar							
RICE PADDY (LB) 1	60000.00	4800000.00	150000.00	87200.00	1090000.00	3985000.00	10172200.00
RICE (ACRES) MILPA	45.00	300.00	100.00	34.00	100.00	2240.00	2819.00
YIELD(LB)/AC (MILPA)	1000 00	1000.00	1500.00	800 00	1500.00	1500.00	1216 67
RICE (AC./MECH)	10.00	1500.00	-	40.00	470.00	250.00	2270.00
YIELD LB/AC.MECH.	1500.00	3000.00	-	1500.00	2000.00	2500.00	2100.00
TOTAL ACREAGE	55.00	1800.00	100.00	74.00	570.00	2490.00	5089.00
CORN (LB)	7794000.00	9750000.00	231000.00	17210000.00	177000.00	6000000.00	41162000.00
CORN (ACRES MILPA)	520.00	1500.00	231.00	2790.00	295 00	6000.00	11336 00
YIELD(LB)/AC (MILPA)	1200.00	1500.00	1000.00	1500.00	600.00	1000.00	1133.33
CORN (ACRES/MECH)	4780 00	3000.00	0.00	5210.00	-	-	12990.00
YIELD LB/AC. MECH.	1500.00	2560.00	0.00	2500.00	-	-	2186.67
TOTAL ACREAGE	5300.00	4500.00	231.00	8000.00	295.00	6000.00	24326.00
GREEN CORN(AC.)	-	-	0.00	-	-	-	-
RK BEANS (LB)	2191400.00	1323000.00	36000.00	1934200.00	15000 00	160000.00	5659600.00
RK BEANS (ACRES) MILP	5.00	300.00	90.00	250.00	30.00	400.00	1075.00
YIELD(LB)/AC (MILPA)	400.00	400.00	400.00	400.00	500.00	400.00	416.67
RK BEANS (AC./MECH)	3649.00	2005.00	-	3057.00	-	-	-
YIELD LB/AC.MECH	600.00	600.00	-	600.00	-	-	-
TOTAL ACREAGE	3654.00	2305.00	90.00	3307.00	30.00	400 00	9786.00
PIGS							
HEADS	3700 00	8500.00	1506 00	6000 00	110 00	4000.00	23816 00
SLAUGHTER (HD)	741 00	1396 00	2337.00	5807 00	204 00	988 00	11553 00
LIVE WEIGHT (LB)	150423 00	344700 32	392101.86	1006794.74	34680.00	167960 00	2096659 92
DRESS	90253 80	268995 24	235265.79	704732.77	22440.00	108680.00	1430367.60
LIVEWEIGHT(LB)/HD	203.00	246.92	167.78	171 02	170 00	170.00	181.48
DRESSWEIGHT(LB)/HD	121.80	192.69	100 67	119.71	110.00	110.00	123.81
MILK (LB)	720000.00	10100.00	-	2004826.00	-		2734926.00
YIELD/HD	3600.00	100.00	-	0 00	-	-	1850 00
POULTRY							
BROILERS							
NO.OF BIRDS	130000 00	1800000.00	38200.00	1914169.00			3882369.00
LIVE WEIGHT	585000 00	8100000 00	171900.00	8613760.50			17470660.50
DRESS WEIGHT	455000.00	6300000.00	121100.00	6613368.00			13489468.00
LIVEWEIGHT(LB)/BIRD	4 00	4.50	4.50	4.50			4.50
DRESSWEIGHT(LB)/BIRD	3 50	3.50	3.17	3.45			3.47
LAYERS	8574 00	9000.00	1000.00	69882.00		300.00	88756 00
EGGS (DOZ)	178625 00	166667.00	16833 00	1058947.00	-	5050.00	1426122.00
EGGS	2143500.00	2000004.00	201996.00	12707364.00		60600.00	17113464.00
TURKEY DRESS (LB)	-	-	-	141804.00	-	-	141804 00
TURKEY(NO)	-	-	-	12875 00	-	-	12875.00
DRESSWEIGHT(LB)/BIRD	-	-	-	11.01	-	-	11.01

Cont TABLE 74

	COROZAL	O. WALK	BELIZE	CAYO	ST. CREEK	TOLEDO	TOTALS
2. LIVESTOCK							
CATTLE	1700.00	21000.00	6000.00			1600.00	30300.00
DAIRY (HD)	200.00	1000.00	-				1200 00
BEEF (HD)	1500.00	20000.00			460.00		21960.00
SLAUGHTER(HD) 3	592.00	832.00	1387.00	4810.00	77.00	172.00	7870.00
LIVEWEIGHT(LB)	362878.24	578905.60	867596.24	3349347.30	48083.42	120744.00	5327554.80
DRESSWEIGHT(LB)	217725.76	303222.40	607311.82	2009618.00	24041.71	60372.00	3222291.69
LIVEWEIGHT(LB)/HD	612.97	695.80	625.52	696.33	624.46	702.00	676.94
DRESSWEIGHT(LB)/HD	367.78	364.45	437.86	417.80	312.23	351.00	409.44
	-	-	7500.00	-	1280327.00	50000.00	1337827.00
BANANA (ACRES)	-	-	30.00	-	5912.40	250.00	6192.40
YIELD(BX)/AC (BANANA)	-	-	250.00	-	216.55	200.00	216.04
CITRUS							
ORANGE (90 LBS/BOX)	-	-				15000.00	1681028.00
ORANGE (ACRES)	-		90.00	5522.00	25000.00	550.00	31162.00
G. FRUIT (80 LBS/BOX)	-	-				212.00	1102999.00
G.FRUIT (ACRES)	-		300.00	511.00	8000.00		8811.00
SUGAR(L. TONS) 2	50039.00	50258.00	-	-	-	-	100297.00
SUGARCANE(L. TONS)	482881.00	494561.00	-	-	-	-	977442.00
SUGARCANE(ACRES)	28405.00	30500.00	-	-	-	-	58905.00
MOLASSES (L.Tons)		29406 17	-	-	-	-	29406.17
YIELD(LT)/AC (S.CANE)	17.00	20.00	-	-	-	-	14.00
YIELD(LT)/AC (SUGAR)							
YIELD(LT)/AC (MOL)							
PETROJAM							
TOTAL PLANTED (ac)	2000.00						2000.00
TOTAL HARVESTED (ac.)	1500.00						1500.00
YIELD (TONS)/AC.	30.00						30.00
TOTAL DELIVERED	121256.00						121256.00
TONS/ACE							
M.T. MOLLASSES(LT)	17467.00						17467 00

Source : Ministry of Agriculture

TABLE 75

FOOD VALUE IMPORTS BY FOOD GROUPS AS A % OF TOTAL FOOD IMPORTS, AND FOOD IMPORTS AS A % OF TOTAL IMPORTS 1986 - 1990

Description (Groups)	1986 ('000 BZ $)	1987 ('000 BZ $)	1988 ('000 BZ $)	1989 ('000 BZ $)	1990 ('000 BZ $)
1. STAPLES	8,126	8,380	10,483	10,872	13,187
Staples as % of Total Food Imports	17.02	16.01	18.44	16.35	18.69
2. LEGUMES + NUTS	1,150	950	560	1,171	2,784
Legumes + Nuts as % of Total Food Imports	2.41	1.82	0.98	1 76	3.95
3. FRUITS	1,199	1,019	1,206	1,454	1,538
Fruits as % of Total Food Imports	2.51	1.95	2.12	2.19	2.18
4. VEGETABLES	4,219	4,280	4,774	4,530	5,344
Vegetables as % of Total Food Imports	8.84	8.18	8.40	6.81	7.57
5. FOOD FROM ANIMALS	14,923	18,094	18,211	23,387	22,316
Food / Animals as % of Total Food Imports	31.26	34.57	32 03	35.17	31.62
6. FATS + FAT SUBSTITUTE	4,235	4,418	5,589	4,778	6,421
Fats + Fats Sub. as % of Total Food Imports	8.87	8 44	9.83	7.18	9.10
7. MISCELLANEOUS	5,633	4,074	3,578	3,610	4,112
Miscellaneous as % of Total Food Imports	11.80	7.78	6 29	5.43	5 83
8. MIXED FOOD GROUPS (OTHERS)	3,140	3,220	6,369	7,795	7,046
Mixed / Groups as % of Total Food Imports	6.58	6 15	11.20	11.72	9.99
TOTAL FOOD IMPORTS	$42,625	$43,623	$50,770	$57,597	$62,748
Food Imports as a % of Total Imports	19.57	18.31	15.71	15.42	16.51
TOTAL IMPORTS	243,925	285,885	361,948	431,390	422,498

Source : Trade Report, Central Statistical Office.

TABLE 76

QUANTITY AND VALUE FROM IMPORTS OF STAPLES (GRAINS, ROOTS, FRUITS AND TUBERS) 1986 - 1990

ITEMS	1986 ('000 Bz)		1987 ('000 Bz)		1988 ('000 Bz)		1989 ('000 Bz)		1990 ('000 Bz)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Wheat & Meslin Mixed, Wheat Rye	24,439,750	3,463	18,388,040	2,621	21,939,584	4,026	30,315,749	5,565	23,229,910	5,03
Rice in the husk or husked	306,846	136	859,695	359	14,821	12	400,086	218	8,670	
Other Rice	233		-	-	-	-	-	-	-	-
Other Rice etc New SITC	3,816	7	11,571	11	137,355	96	480	1	4,951,540	2,117
Maize	88,885	83	193,081	235	135,526	167	222,460	291	117,323	16
Buckwheat, Millet	55,486	66	49,486	66	15,501	19	69	-	10,422	1
Cereal Flour or Wheat or Meslin	3,505,577	794	572,642	294	681,412	380	195,868	94	345,540	136
Groute + Meal or Wheat	14,098	25	33,929	42	26,041	45	4,894	12	6,815	13
Cereal Flour or Maize	111,943	46	141,593	57	158,139	75	151,995	72	124,270	6
Cereal Flour of Rye	65	-	137	-	-	-	351	-	64	-
Other Cereal Flour	1,563	1	807	1	13,255	19	6,185	2	26,270	1
Cereal grouts + Meal	10,972	13	8,961	7	44,017	55	22,379	32	58,312	79
Other Cereal grouts, meal	145,540	163	69,374	96	66,785	108	51,257	75	99,263	12
Prepared foods obtained by swelling or roasting of cereals	257,571	482	296,358	553	363,835	667	504,685	973	707,683	1,19
Bananas, Fresh	-		-	-	*120	4		-		
Potatoes	4,104,636	2,435	4,878,383	2,916	4,714,627	2,818	4,340,859	2,552	4,855,013	2,88
Yam, Fresh or Dried, etc	68	-	765	1	-	-	-	-	-	-
Yam	344	1	-	-	140		802	1	267	
Other roots + Tubers, FND	1,454	3	317	1	1,959	7	1,228	3	423	1
Rice Semi milled Milled, packaged	-		1,695,838	697	2,448,175	1,439	43,885	32	53,107	20
Oats	-	-	-		2,591	4	54,667	74	15,662	2
Malt flour	-	-	123,456	50	-	-	2	-	40,026	1
Other malt, Roasted or not	816,183	344	862,400	351	1,139,884	521	1,695,776	853	2,251,843	1231
Macaroni, Spaghetti & Similar Prod	21,730	28	12,217	19	14,448	19	9,809	16	32,900	4
Flour meal & Flakes	32,000	35	3,500	2	299	1	1,002	2	1,269	
Flour of leguminous Vegetable	62		-	-	118				-	
Flour & meal of other roots			7		-			-	-	
Tapioca & Sago & Substitutes	268	1	288	1	254	1	1,521	4	400	
		8,126		8,380		10,483		10,872		13,18

* Boxes

Source. Trade Report, Central Statistical Office.

TABLE 77

QUANTITY AND VALUE FROM IMPORTS OF LEGUMES + NUTS
1986 - 1990

ITEMS	1986 ('000 Kr)		1987 ('000 Kr)		1988 ('000 Kr)		1989 ('000 Kr)		1990 ('000 Kr)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Brazil nuts-Cashew nuts shelled/not	1,513	9	-	-	279	1	56	1	324	2
Other nuts,for dried, shelled or not	3,446	-	4,858	22	4,985	13	758	2	6,018	16
Groundnuts Peanuts Prepar. or preser.	315	-	1,434	1	49	2	6,920	12	-	-
Other nuts otherwise prepare.	6,507	23	11,733	44	6,068	35	21,751	134	6,144	43
R,K Beans, Shelled	965,497	885	633,000	687	248,500	274	602,500	617	2,569,600	2,422
Beans other than R.K.Beans	80,660	37	164,927	80	186,038	76	267,492	119	94,915	42
Split peas, shelled	175,864	99	122,988	64	178,384	70	185,391	117	158,796	98
Other peas, shelled	66,787	32	35,692	33	52,141	41	68,378	62	94,651	72
Other dried leguminous vegetable	3,862	3	904	1	879	1	6,290	2	610	1
String beans, fresh/chilled	3,147	3	10,561	8	10,022	12	3,425	3	876	-
Other peas-beans fresh/Chilled	9,117	7	1,595	2	2,256	2	37,618	14	13,296	4
Pigeon peas	32,947	8	-	-	-	-	-	-	-	-
Pigeon peas sold in packages cooked/f	1,021	2	4,603	6	5,117	7	468	1	90	-
Other pigeon peas,cooked/freezed	946	1	-	-	-	-	-	-	-	-
Blackeye peas,sold in packages	62	-	-	-	-	-	72	-	-	-
Other peas sold in packages cooked/fr	711	1	1,839	2	1,288	2	5,672	10	9,812	15
Peanut butter	12,258	15	-	-	-	-	301	1	-	-
Stringbeans in packages cooked/freeze	14	-	675	1	288	1	998	-	1,141	2
Other peas, cooked/freezed	201	-	476	1	1,018	2	2,619	6	753	2
Locust beans, fresh/dried	66	-	122	1	-	-	1	-	2,175	6
Other peas	:	-	-	-	13,928	28	58,593	64	42,635	57
Other stringbeans, preser by freezing	) 350	-	38	-	-	-	425	1	123	-
String Beans	48	-	-	-	-	-	-	-	-	-
Oth.VegProvisional pres./Brine	2146	5	152	1	1560	1	2160	5	48	-
Pigeon Peas & Beans F,Ch	-	-	-	-	-	-	22	-	42	-
Totals		1,150		954		560		1,171		2,784

Source: Trade Report, Central Statistical Office.

TABLE 78

QUANTITY AND VALUE FROM IMPORTS OF FRUITS
1986 - 1990

ITEMS	1986 ('000 Bz)		1987 ('000 Bz)		1988 ('000 Bz)		1989 ('000 Bz)		1990 ('000 Bz)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Tangarine, Mandarines + Clementin	-	-	-	-	-	-	-	-	-	-
Lime, Fresh	224	-	224	-	-	-	-	-	-	-
Apples, Fresh	293,916	270	195,969	175	332,230	302	470,440	381	261,436	24
Grapes, Fresh	109,455	130	74,534	90	132,087	177	231,760	319	96,608	146
Coconuts, Dried includ Dessicate		-	16	-	10	-	132	1	517	
Pears + Quinces, Fresh	51,805	54	49,480	55	64,155	60	66,293	58	28,693	2
Stone Fruit, Fresh	9,812	15	6,040	7	18,116	26	3,885	9	10,324	1
Berries, Fresh	568	1	980	3	968	3	266	1	262	1
Avacodoes	1,007	1	758	1	-	-	-	-	22	-
Other Fruits, Fresh	354	1	-	-	818	4	772	1	57,200	2
Other Fresh Fruits	1,036	2	8,452	13	5,256	10	326	2	491	
Other Fruits, Dried	1,071	4	1,458	6	835	3	1,135	6	1,973	6
Figs, Dried	25	-	17	-	27	-	165	1	20	
Grapes, Dried	61,737	86	60,840	104	74,610	117	53,031	92	78,065	13
Other Fruits, Dried	32,537	55	-	-	16,114	39	14,786	66	34,657	1
Other Citrus Fruits, Fresh	-	-	-		224	-	-	-	-	-
Grapefruit, Fresh	2	-	-	-	224	-	-	-	-	
Mangoes	-	-	-	-	-	-	34,650	19	-	-
Pineapple	4,047	7	1,857	2	-	-	1,701	1	-	
Melon	4,471	4	2,657	1	4,898	2	3,420	1		-
Citrus Peel,Preserved by Sugar	774	1	816	1	879	2	717	2	-	-
Oth Citrus Peel, Preserved by Sug	14,576	30	20,286	57	31,586	78	28,209	67	25,671	1
Other Citrus Fruits, Dried		-	-	-	673	1		-	-	
Orange otherwise prep /pres-		-	-			-			37	
Grapefruit, Concentrate	144	1	197	5	20	-	161	2	1,470	
Grapefruit, Not Concentrated	13	-	4		1	-	41	-	217	
Orange, Concentrate	122	2	246	8	-	-		-	30	
Orange, Not Concentrate	9,383	33	1,103	10	72	1	30	-	4	
Mixed Grapefruit + Orange Juices	14		-	-	-	-	-		-	
Lime, Not Concentrated	11		7	-	4	-	2		-	
Pineapple Juices + Pineapple Base	3,051	22	11,773	76	13,008	80	10,601	71	20,111	1
Other Fruit Juices	25,301	125	37,810	213	22,837	121	18,878	116	43,223	25
Fruit,Preserved by Freezing+Sug	1,089	2	-	-	-	-	-		-	
Oth Fruit,Preserved by Freez -Sug	393	1	1,817	4	1,912	4	961	3	2,467	
Fruits, Preserved by Freez -sug	156		-		-	-	20	-	-	-
Fruits Provisionally Preverved	87	-	-	-	-	-	-		-	-
Pineapple, Preserve in Sulphurh20	165	-	283	-	-	-	-		-	-
Oth fruits, preser. in Sulph H20		-	237	-	400	1	360	1	1,200	
Peel or Melon + Citrus Fruit	2	-	-	-		-	1			
Mangoes Otherwise Prepared	89	-	-		116	-		-	289	
Pineapple Otherwise Prepared	9,685	12	20,137	22	20,386	20	32,918	36	31,176	
Oth Fruits Otherwise Prep.	137,885	180	124,695	164	99,416	153	143 496	188	205,850	2
Breadfruit, Other Fresh	123,017	160	176	-		-	-		-	
Grapefruit otherwise prep orpre	-		-	-		-	9,000	10	-	
Pineapple preserved										
or cooked, no sug added			2,949	1	4,912	2	1,012			
Totals		1,199		1,018		1,206		1,454		1,53

Source: Trade Report, Central Statistical Office.

TABLE 79

QUANTITY AND VALUE FROM IMPORTS OF VEGETABLES
1986 - 1990

ITEMS	1986 ('000 Bz)		1987 ('000 Bz)		1988 ('000 Bz)		1989 ('000 Bz)		1990 ('000 Bz)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Tomato Juice	3,077	20	4,081	14	1,953	14	2,489	19	2,616	16
Other Vegetable Juices	2,671	14	5,520	21	3,449	22	1,392	9	1,656	18
Tomatoes, Fresh or Chilled	5,038	4	10,963	4	7,430	11	3,745	3	46	-
Carrots, Fresh or Chilled	428,812	313	567,676	242	524,296	199	497,691	132	435,593	166
Beets, Fresh or Chilled	8,139	6	11,029	8	12,278	10	12,941	9	9,646	7
Sweet Pepper, Fresh or chilled	7,349	7	6,504	4	8,481	4	2,592	2	150	
Garlic, Fresh or Chilled	14,938	9	42,071	36	8,148	8	22,745	45	32,739	54
Onion Fresh or Chilled	1,849,359	1,253	2,018,808	910	2,071,191	903	2,415,485	1,092	2,347,986	998
Cabbage, Fresh or chilled	369,498	197	516,298	155	546,742	163	407,979	127	239,846	71
Cucumbers , fresh or Chilled	6,227	3	7,460	4	8,518	4	3,380	4	1,045	-
Pumpkins, Fresh or Chilled	15,394	9	11,662	6	10,701	5	3,727	2	708	-
Beulangers, Fresh or Chilled	628	-	480	1	2,640	3	280	-	-	-
Zuchini, Fresh or Chilled	500	-	260	-	1,500	1	320	-	-	-
Lettuce, Fresh or Chilled	55,445	41	126,319	98	126,725	107	118,010	93	126,716	96
Other Veg Fresh or Chilled	194,217	191	164,665	169	204,619	193	144,135	113	119,931	102
Carrotwheth.cookor pres by Freez	84	-	-	-	-	-	-	-	-	
Eschallots, Fresh or Chilled		-	1,466	2		-	-	-	-	-
Carrot in Pack Retailed or Cooked	61	-	-			-	672	1	293	1
Other Veg. in Packs cooked	812	1	8,089	12	-	-	-	-	-	-
Beans etc, Preserved by Freezing	3,768	6	8,026	12	6,216	9	-	-	-	-
Oth.Veg Cooked or Preser.by Freez	13,311	21	-	-	-	-	-	-	-	-
Oth.Veg. preserved in Brine	2,146	5	152	1	1,560	1	2,160	5	48	
Dried or evap.veg,whol,cutorslice	5,773	20	6,474	25	9,084	36	12,203	37	13,655	48
Onion, Prepared or Preserved	271	-	584	1	211	-	942	1	2,614	2
Tomaotes, Prepared or Preserved	60	-	1,755	1	-	-	-	-	-	-
Pickles, prepared or preserved	10,763	15	15,778	18	10,743	13	20,724	24	17,580	28
Oth Veg,Fruit prepared or preserv	32,924	38	24,471	37	13,349	26	53,703	77	16,439	28
Tomatoes prep orpreserve by Vineg	59,260	25	47,247	38	43,516	35	53,086	50	64,666	63
Tomato Paste	38,303	43	44,905	42	28,846	28	36,948	43	49,317	38
Oth Veg prep.orpreserve otherwise	484,681	594	655,945	725	678,080	813	614,286	798	960,813	1,051
Onion partial pres Not/Immed Cons	-	-	-	-	24	-	24	-	-	-
Tomato Ketchup + Tomato Sauce	341,792	252	416,118	343	375,274	341	498,868	375	613,381	419
Oth Sauces, Mixed Condiments	575,130	856	678,207	991	942,158	1,424	744,200	1,141	970,704	1,513
Soups + Broths, Liquid	238,762	221	242,502	259	292,401	303	180,488	210	429,605	403
Soups + Broths, in Solid	21,750	53	36,963	99	36,903	97	106,955	118	51,631	91
Okra, Fresh or Chilled	-		-	-	-	-	-	-	-	
Vet Cooked or Preserved by Freezi	788	2	-	-	-	-		-	-	
Arrow root Fresh/dried	-		19		-	-	-	-	44	
Hop cones & Lupulin	-	-	300	2	2575	31	-	-	6752	131
Totals		4,219		4,280		4,774		4,530		5,3--

Source: Trade Report, Central Statistical Office.

TABLE 80

QUANTITY AND VALUE FROM IMPORTS OF FOOD FROM ANIMALS
1986 - 1990

ITEMS	1986 ('000 Bz)		1987 ('000 Bz)		1988 ('000 Bz)		1989 ('000 Bz)		1990 ('000 Bz)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Meat of Bovine animals, F,Ch/Fro.	9,464	22	23,137	95	9,932	34	8,091	60	11,420	41
Meat of Sheep, F,Ch,Fro	20,280	68	17,540	60	10,240	35	13,301	36	-	-
Meat of Swine, F,Ch, Fro.	40,334	121	36,697	92	38,133	84	44,453	127	53,010	142
Other Parts of Chicken, F,Ch,Fro	-	-	2100	4	-	-	445	1	869	1
Chicken, Whole,Killed/Dress.	50,849	71	42,220	64	15,029	22	1,181	3	130,573	205
Other Poultry, Killed or Dress.	73,555	164	183,526	104	71,432	150	20,253	46	35,096	74
Pork Salted or in Brine	986,295	1,001	920 488	897	918,387	977	1,041,249	1,236	1,096,040	1,371
Bacon	26,106	108	6,369	25	15,507	38	26,075	58	91,277	214
Ham	87,240	184	46,494	113	104,749	223	52,861	121	142,884	328
Other Pig Meat Dried or Smoke	-	-	2,324	-	-	-	59	1	-	-
Beef, Salted or in Brine	27,850	41	49,470	71	18,043	29	26,429	58	659	115
Other Meat, Salted or in Brine	-	-	434	1	82	1	105	-	3,086	6
Corn Beef, Canned	185,862	337	312,336	561	448,022	698	274,221	606	342,343	674
Ham	473,243	881	694,750	1,194	702,160	1,283	722,283	1447	534,892	1,437
Sausages+thelikeofmeat,offal,Can	412,303	732	337,622	660	489,397	932	599,782	1,183	489,504	1,007
Oth.Sausages+thelikemeat off orBd	119,487	276	156,930	350	130,581	316	139,589	349	595,622	515
Luncheon Meat	122,155	121	168,103	300	424,971	592	73,018	377	411,554	645
Oth. Prep or pre.meat or Offals	627,756	1,205	331,270	656	471,253	937	478,578	954	567,950	1,120
Milk Cream,unsweetenedinliq/solid	391,331	527	795,865	658	937722	852	1,220,352	1,122	699,107	653
Milk+Cream,sweeten solid/semi-sld	2,522,079	2,451	2,827,222	2,599	2,425,974	2,228	3,135,915	3,408	2,243,756	2,572
Milk+Cream,unsweented,liquid, >8%	862,970	696	1,507,368	1,205	1,419,401	1,238	2,084,780	1,858	1,939,281	1,898
Milk+Cream,unsweented,S/L.>8% BF	301,381	226	5,530	6	11,441	14	30,161	34	192	-
Mackerel,Dried,Salt/Brine,Smoke		-		-	-	-		-	113	-
Milk+Cream,in solid,>8%	736,749	1,625	1,162,165	2,218	818,372	1,811	1,751,612	4,672	1,492,743	4,134
Milk+Cream,in solid,8% MF	688,661	1,317	953,965	1,751	582,213	1,237	299,223	747	151,289	293
CreamFresh N concen.or sweeten	8,520	17	7,764	16	8,332	22	9,860	23	11,398	23
Cheese + Curd	1,185,281	1,202	1,029,230	2,373	1,164,705	2,858	1,054,959	2,864	1,231,207	3,267
Eggs for Hatchening(Doz)	104,227	483	130,671	584	173,442	756	200,918	575	178,708	654
Eggs in Shell for Eating(Doz)	69,962	140	67,782	118	61,252	117	23,240	47	28,500	51
Oth eggs+yolk,Fresh or Dried	-	-	100				3,825	6	58	
Aquarium Fish (NO.)	-	-	-		-		1,150	2		
Oth Fish live/Dead,F,Ch,Fro	17		1,248	2	-		2,225	19	40	-
Oth Fish,Drid Sal,Brn,Smke,NCook	60	-	58	-	269	-	323	3	868	1
Crust+Molluscs,live or Dead,F,Ch	13	-	4,397	29	6,380	90	4,156	84	28,684	366
Crustaceans + Molluscs Frozen	4,145	16	-		195	6	1,490	10	100	1
Crust+Molluscs,Salted,Brine,Dried	820	9	3,905	20	8,381	90	8,649	81	9,573	72
Sardines, prepared or preserved	269,389	370	453,890	594	171,198	221	451,972	609	293,556	369
Herring, prepared or preserved	72	-	12,586	11	-		3,925	12	-	
Mackerels, prepared or preverved	-	-	63,457	76	2017	4	110,635	157	14,624	23
Caviar+CaviarSubstiteprep orprve	707	1			680	2	7,036	19	1,568	14
Salmon, prepared or preserved	254	2	965	4	5,336	31	6,062	36	-	-
Other prepared or preserve Fish	18,029	44	48,745	193	16,510	82	70,996	330	41,782	24
Crust+Moll prep or preserve	29,077	81	-		4,735	9	661	6	842	3
Edible offals, Fresh,Chilled,Frz	14,099	32			4,977	11		-	1,003	2
Oth Meat+Edib offals,F,Ch,Froz	8,694	18	5,594	16	7,851	26			714	1
Milk,Fresh,Not Concen or Sweeten	342,200	334	377,084	374	198,530	155				-
Chich Backs,Neck,Wing,F,Ch,Froz	-		504	1	-			-	270	-
Meat Extract,Meat Juices,Fsh Ext	26	-	7,503	26	-	-	13		50	-
Offals of Bovine Animals,F,Chyfrz	-	-	-		-	-	171	-	22	58
Cod,dried salted/in brine	-	-	24		29			-		
Totals		14,923		18,094		18,211		23,387		22,316

Source, Trade Report Central Statistical Office

TABLE 81

QUANTITY AND VALUE FROM IMPORTS OF FATS AND FAT SUBSTITUTES
1986 - 1990

ITEMS	1986 ('000 Bz)		1987 ('000 Bz)		1988 ('000 Bz)		1989 ('000 Bz)		1990 ('000 Bz)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Butter, Fresh/Salted	5,638	-	247,170	455	116,301	75	95,299	387	206,272	575
ther butter, included ghee	11,550	24	20,472	41	22,272	47	4,840	12	6,429	19
rd	3,660,350	2,861	2,872,943	2,245	3,722,047	3,034	2,912,903	2,373	3,772,009	3,026
Other lards, other pig fats	3,459	5	29,223	40	388	-	8,981	9	3,795	6
Margarine	876,252	874	983,385	1,056	1,114,659	1,332	933,385	1,131	1,014,993	1,420
itation lard+lard substitutes	474,404	467	575,798	579	740,057	782	533,905	563	683,519	700
her margarine, imits. lard	3,509	4	1,980	2	326,181	318	278,279	287	477,437	518
Cocoa butter fat/oil	-	-	-	-	122	1	50	1	226	3
Butterfat	-	-	-	-	-	-	6,600	15	62,469	154
		4,235		4,418		5,589		4,778		6,421
Other Fats + and Fats Substitutes										
her animal oils+fats	228	1	65	-	-	-	59	-	49	-
Soya bean oil, refined (Gallons)	5,869	47	15,121	118	20,874	236	13,674	99	10,606	81
Groundnut oil, refined (Gallons)	6	-	-	-	42	1	38	1	8	
her fixed vegetable oil, crude (Gal	56	1	-	-	-	-	4	-	-	
xed vegetable oil, refined (Gallons	42,718	361	35,687	329	52,286	467	61,812	449	71,308	653
nimal+vegetable oils, boiled (Gallon	450	6	66	3	-	-	4	-	624	3
Coconut copra oil, refined			180	4	-	-	30	-	-	
tty acids, acid oil from refining	-	-	4,120	4	-	-		-	-	
her fats of bovine cattle sheep/goa	-	-	-	-	-	-	-	-	6,600	12
Soya bean oil, crude	-	-	-	-	-	-	-	-	2,638	32
Cotton Seed Oil, refined	3,178	15	1,431	15	2,843	33	3,122	32	1,338	19
ve Oil, Crude	4	-	-	-	-	-	4	-	-	
ve Oil, Crude	-	-	20,662	9	-	-		-	969	23
Total		431		482		737		581		823

Source: Trade Report, Central Statistical Office.

TABLE 82

QUANTITY AND VALUE FROM IMPORTS OF MISCELLANEOUS (SUGAR AND OTHER MISCELLANEOUS) 1986 - 1990

ITEMS	1986 ('000 Bz)		1987 ('000 Bz)		1988 ('000 Bz)		1989 ('000 Bz)		1990 ('000 Bz)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Jam prepar ect of citrus fruits		-	-	-	-	-	420	1	-	-
Jams+Jellies of pineapple base pre	937	1	211	-	93	-	824	2	-	
Other Jams,Fruit Jellies	4,550	6	7,600	9	8,647	10	11,359	16	14,716	21
Icing sugar	52,714	50	36,657	47	49,193	57	57,825	69	68,318	95
Other beet sugar+cane sugar	15,591,525	3,033	1,984,397	458	53,688	56	141		36	
Edible molasses	135	1	28	1	7	-	5		53	1
Glucose, Lactose+Maltose	37,935	25	63,549	42	47,844	47	41,822	31	37,660	26
Other sugar, sugar syrups	1,849	2	4,804	5	3,822	5	10,537	10	15,672	18
Sugar confectionery	139,884	266	208,137	428	306,343	409	275,254	557	298,302	729
Flavoured/coloured sugar,syrups+Mol	25,244	27	10,641	16	25,353	36	37,300	51	35,706	49
Coffee,roasted including ground	126,577	987	103,009	1,015	130,172	1,126	311,832	1,271	498,738	1,330
Coffee substitutes etc	8,284	52	4,529	55	8,517	65	1,329	7	1,249	9
Coffee beans	115,650	169	-	-	-	-	-	-	5,600	21
Cocoa powder unsweetened	11,654	29	34,844	96	63,598	206	60,398	161	38,498	133
confectionery	128,188	412	126,292	564	171,052	711	193,183	655	186,176	881
Cocoa Powder sweetened	1,803	5	43,182	28	40,947	24	59,062	32	57,662	35
Other chocolate+other food prep	19,757	47	32,928	60	28,092	71	23,195	48	60,535	96
Tea	64,616	375	155,912	947	72,408	382	45,862	403	85,298	433
Cloves whole fruit, cloves+stem	186	2	458	2	1,145	6	206	2	463	2
Nutmeg	4,348	21	4,476	30	3,783	26	4,612	39	385	2
Cardamoms	16	2	-	-	6	-	23		67	-
Seed of anise badian	8 083	8	4,280	8	9,925	17	5,931	9	8,527	15
Ginger	190	-	223	1	514	2	275	1	4,425	6
Tumeric	384		255	-	1,790	5	506	-	832	1
Other spices therefore saffron	12,390	34	16,035	45	12,245	42	11,448	35	7,905	27
Roasted chicory+other roast coffe s	355	2	398	3	190	1	749	4	1,095	4
Other extrust essence or conc of co			45		9		3			-
Natural honey			2		22	-	5	-	-	-
Syrups, of cane sugar			44	-	475	2	142	2	155	2
Other coffee			20				1,500	1	152	2
Extracts, Essences/Conc of coffee					-	-	5			
Raw sugar				-		-			110	
Pepper of Genus'Pepper'	78 948	72	105,304	202	121,338	222	129 932	181	193,128	134
Pimento of Genus'Capsicum/Pimento'	539	3	927	3	2,875	13	7,601	16	7,829	9
Vanilla	95		244		-	-	-		24	
Cinnamon+Cinn Tree Flower	8,599	22	3,514	9	10,278	37	2 979	10	7,404	31
Totals		5,633		4,074		3,578		3,610		4 112

Source: Trade Report, Central Statistical Office.

TABLE 83

QUANTITY AND VALUE FROM IMPORTS OF MIXED FOOD CROPS AND OTHER MISCELLANEOUS 1986 - 1990

ITEMS	1986 ('000 Bz)		1987 ('000 Bz)		1988 ('000 Bz)		1989 ('000 Bz)		1990 ('000 Bz)	
	lbs	Value	lbs	Value	lbs	Value	lbs	Value	lbs	Value
Infant food	152,477	278	445,287	853	398,304	831	539,992	1,075	520,529	917
Infant food	126,859	440	122,553	416	161,736	474	213,448	756	244,647	591
Mustard Flour+Prepared Mustard	48,001	52	38,151	40	40,091	39	54,124	59	38,129	42
Homogenized Composite Food Prep.	3,228	5	13,035	15	7,310	11	5,750	9	10,821	17
Natural Yeast	67,467	182	56,906	175	85,275	274	63,443	226	80,827	279
Bread,Chips,Biscuits & Other Ordinary	300	1	522	2	431	1	1,640	5	2,923	5
Biscuits unsweetened	80,801	71	101,287	84	103,744	77	99,958	82	91,329	82
Biscuit sweetened	642,015	587	754,870	572	777,783	645	790,747	797	754,693	825
Ice cream cones	3,607	6	102	-	170	1	272	1	513	2
other pasting Biscuit, cakes	30,701	75	34,952	78	24,792	67	35,327	112	58,858	155
Preparation containg cocoa	42,448	95	206,678	580	142,471	437	198,321	615	194,840	594
Other prep. of flour meal starch/malt	228,360	357	116,752	195	100,673	136	85,741	147	106,063	199
Communion wafers,empty cachete	-	-	214	-	-	-	15	1	-	-
Malt extract	-	-	-	-	123,486	54	50	-	-	-
Other food preparation	270,297	559	294,650	586	626,352	913	500,670	966	596,212	891
Flavouring prep. for making beverages	166,881	1,269	247,330	1,579	259,952	1,790	339,368	2,362	373,840	2,393
Prepared Baking powder	290,828	435	257,070	399	337,181	519	314,020	447	348,940	508
Vinegar + Substitutes for vinegar(Gal	15,592	77	10,202	54	16,319	96	13,904	74	60,072	107
Totals		4,489		5,628		6,365		7,734		7,607

Source: Trade Report, Central Statistical Office.

TABLE 84

AVERAGE PRICES FOR ESSENTIAL COMMODITIES FOR 1990

Commodities	Belize City Average Price 90	Corozal Average Price 90	Orange Walk Average Price 90	San Ignacio Average Price 90	Dangriga Average Price 90	Punta Gorda Average Price 90	National
Flour	0.47	0.48	0.49	0.49	0.48	0.5	0.48
Rice	0.66	0.6	0.59	0.59	0.58	0.59	0.60
Beans (R.K)	1.24	1.53	1.26	1.19	1.14	1.16	1.25
Corn (Dried)	0.34	0.38	0.5	0.5	0.61	0.35	0.44
Eggs(Doz)	2.52	2.94	2.93	2.59	2.89	2.92	2.79
Milk (Cond.)	0.98	1	1	1	1.01	1.03	1.00
T-Bone Steak	4.76	3.33	3.15	3.31	3.78	3.3	3.60
Pork Chops	5.19	3.08	2.95	2.93	3.56	2.64	3.39
Chicken	1.9	1.87	1.96	1.97	2.05	2.19	1.99
Sugar(White)	0.33	0.34	0.34	0.35	0.35	0.39	0.35

Source: Consumer Price Index, Central Statistical Office.

TABLE 85

AVERAGE MONTHLY VALUE OF FOOD CONSUMED PER HOUSEHOLD 1990

Description	Corozal	O Walk	Belize	Cayo	St Creek	Toledo	URBAN	RURAL	NATIONAL
Food Expenditure	393 97	428 9	424 57	346 77	313 06	324 18	412 65	3-9 18	386 4
Home Consumption	69 14	33 09	18 81	404 61	31 67	99 87	11 33	234 13	103 51
Total Food Consumpt	463 11	461 99	441 38	751 38	344 73	424 05	423 98	583 31	489 91

Country Total Urban Rural	No of Households	District Expenditure	TOTALS	Population	Per Capita Consumption
Corozal	5,560	$463 11	$30,898,699	28,217	$1,095 04
Corozal Town	1,605				
Corozal Rural	3,955				
Orange Walk	5,588	$461 99	$30,979,201	29,462	$1,051 50
Orange Walk Town	2,125				
Orange Walk Rural	3,463				
Belize	13,048	$441 38	$69,109,514	56,131	$1,231 22
Belize City	10,156				
Belize Rural	2,892				
Cayo	6,695	$751 38	$60,365,869	35,194	$1,715 23
San Ignacio/Santa E	1,543				
Benque Viejo Del Ca	636				
Belmopan	1,132				
Cayo Rural	3,384				
Stann Creek	4,009	$344 73	$16,584,270	18,061	$918 24
Dangriga Town	1,551				
Stann Creek Rural	2,458				
Toledo	3,539	$424 05	$18,008,554	17,275	$1,042 46
Punta Gorda Town	538				
Toledo Rural	3,001				
Urban	19,286	$423 98	$98,122,538	87,279	$1,124 24
Rural	19,153	$583 31	$134,065,632	97,061	$1,331 25
National	38,439	$489 91	$225 979,800	184,340	$1,225 87

Source: Household Expenditure Survey, Central Statistical Office

TABLE 88

PRIMARY SCHOOL ENROLLMENT
BY PERCENTAGE OF POPULATION 5 TO 14 YEARS
1980 - 1991

Enrollment %	Year			
	1980	1985	1989	1991
Enrollment	34,615	38,512	44,201	46,023
Population 5-14 years	42,806	46,914	51,216	51,445
Percentage	81%	82%	86%	90%

Abstract of Statistics

TABLE 87

TOTAL PRIMARY SCHOOL ENROLLMENTS BY DISTRICT SEX AND PERCENTAGE OF POPULATION 5 TO 14 YEARS, 1991

Districts	Total Enrollments	Population 5-14 years	Percentage Enrollment
Belize	12,783	13,867	92 2
Male	6,681	7,066	94 6
Female	6,102	6,801	89.7
Corozal	6,426	7,812	82 3
Male	3,245	3,919	82 8
Female	3,181	3,893	81 7
Orange Walk	7,126	8,547	83 4
Male	3,647	4,318	84 5
Female	3,479	4,229	82 3
Cayo	9,163	10,768	85 1
Male	4,816	5,462	88 2
Female	4,347	5,306	82 0
Stann Creek	4,563	5,021	90 9
Male	2,363	2,546	92 8
Female	2,200	2,475	88 9
Toledo	4,584	5,430	84 4
Male	2,317	2,714	85 4
Female	2,267	2,716	83 5

Source Abstract of Statistics

TABLE 88

PRIMARY SCHOOLS
BY MANAGEMENT 1984 - 1991

Year	Primary Schools		Total
	Government	Government Aided	
1984	24	201	225
1985	24	202	226
1986	24	202	226
1987	23	203	226
1991	32	204	236

Abstract of Statistics

TABLE 89

PRIMARY SCHOOL TEACHERS BY DISTRICT AND QUALIFICATION - BOTH SEXES 1965 - 1991

Year	Qualifications				Pupil/Teacher Ratio
	Trained	Untrained	Total	% Trained	
1965	127	772	899	14 0	28 1
1970	309	764	1073	28 8	28 0
1975	399	787	1186	33 6	26 8
1980	501	920	1421	35 3	24 4
1985	687	895	1582	43 4	24 3
1987	696	882	1578	44 1	25 2
1991	902	847	1749	51 6	26 3

Source. Central Statistical Office

TABLE 90

ENROLLMENTS BY DISTRICT AND SEX RATIO, 1990

District	Both Sexes	Male	Female	Sex Ratio Male/Female
Corozal	1,055	511	544	0 94
Orange Walk	911	476	435	1 09
Belize	3,618	1,626	1,992	0 82
Cayo	1,286	611	675	0 91
Stann Creek	590	286	304	0 94
Toledo	444	218	226	0 96
Total	7,904	3,728	4,176	0 89

Source Ministry of Education

TABLE 91

SECONDARY SCHOOLS BY DISTRICT AND MANAGEMENT, JUNE 1990

District	Total	Government	Roman Catholic	Adventist	Anglican	Other
Corozal	3	1	0	1	0	1
Orange Walk	3	2	1	0	0	0
Belize	16	4	3	1	1	7
Cayo	4	2	1	1	0	0
Stann Creek	2	1	0	0	0	1
Toledo	1	0	0	0	0	1
Total	29	10	5	3	1	10

Source Ministry of Education

TABLE 92

PUPIL TEACHER RATIOS BY DISTRICT
JUNE 1990

District	Total No Pupils	Total No Teachers	Pupil/Teacher Ratio
Corozal	1,055	67	15 8 1
Orange Walk	911	62	14 7 1
Belize	3,618	272	13 3 1
Cayo	1,286	94	13 7 1
Stann Creek	590	46	12 9 1
Toledo	444	23	19 3 1
Total	7,904	564	14 1

FIGURES

FIGURE 1

BELIZE HEALTH SYSTEM

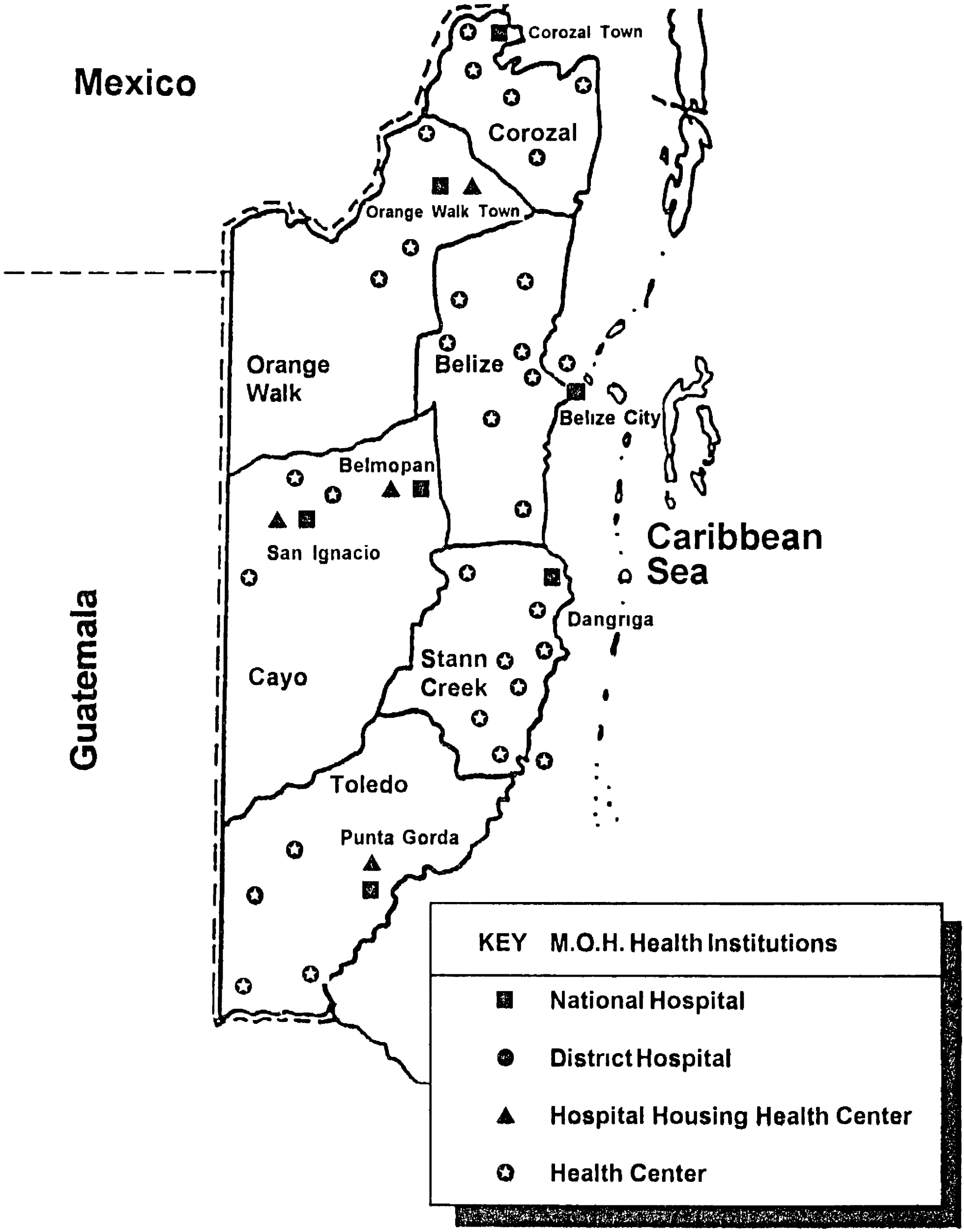
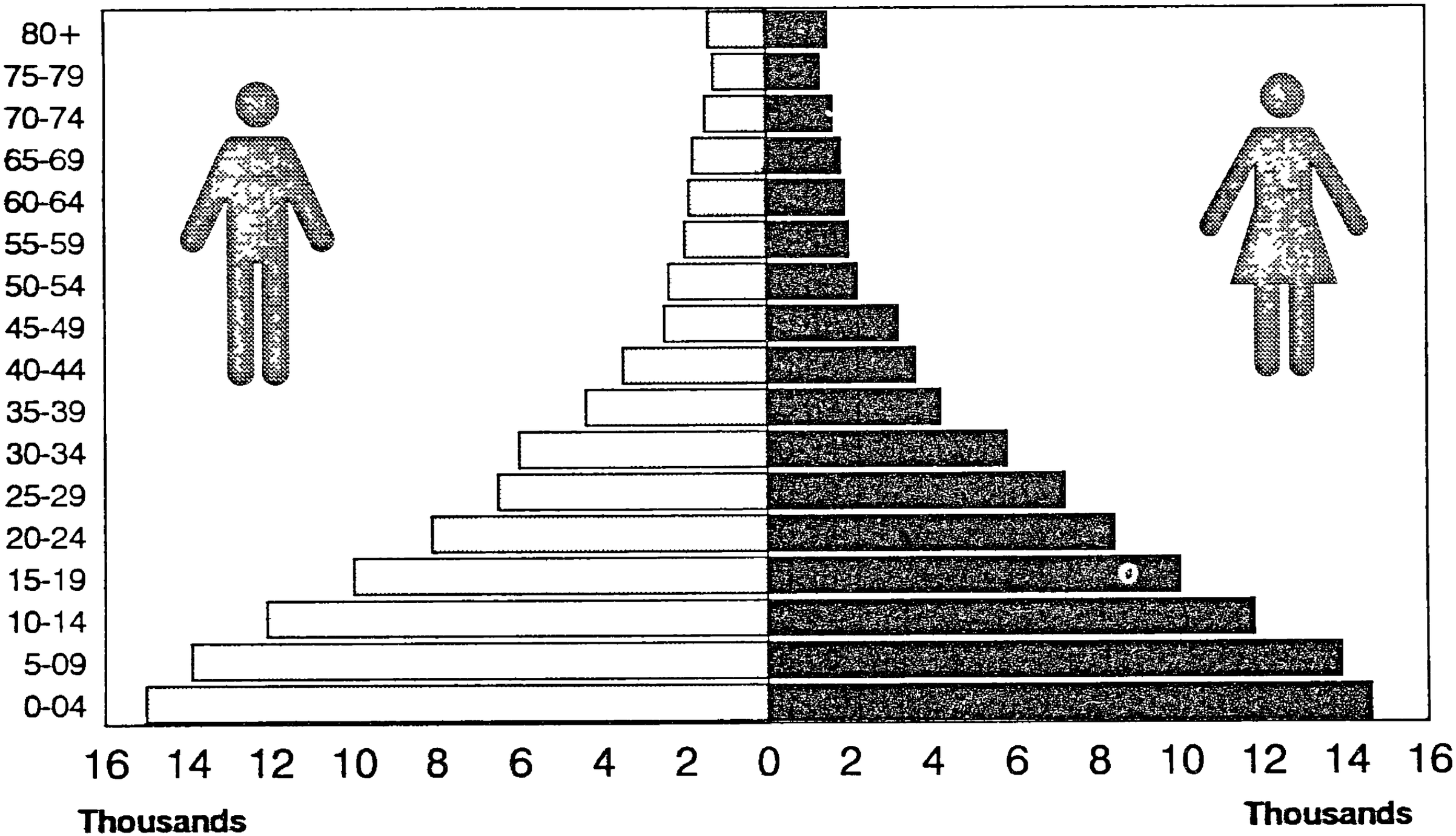


FIGURE 2

BELIZE

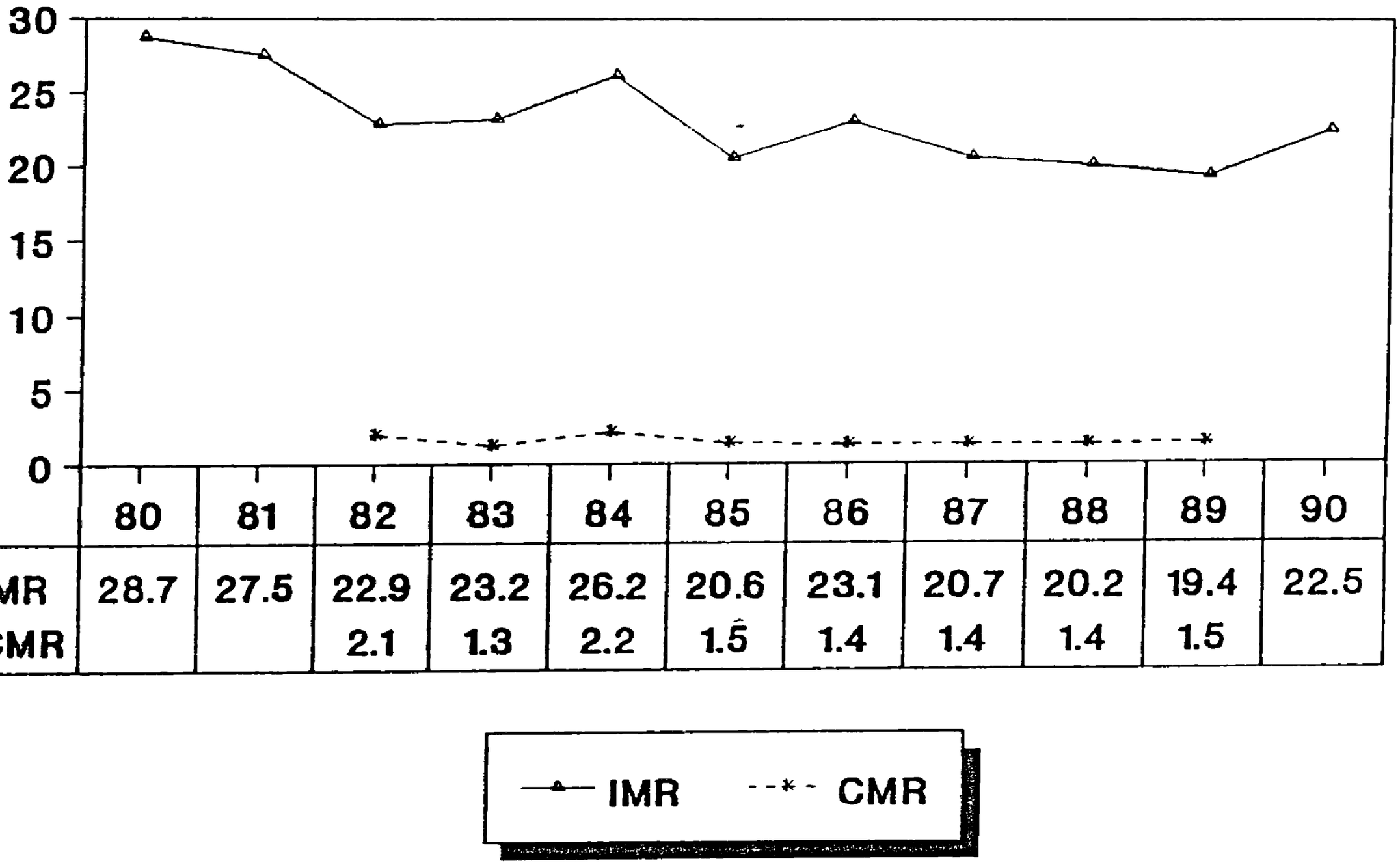
TOTAL POPULATION 1992



Source: 1991 Population Census
Central Statistical Office

FIGURE 3

INFANT AND CHILD MORTALITY
BELIZE 1980-1990

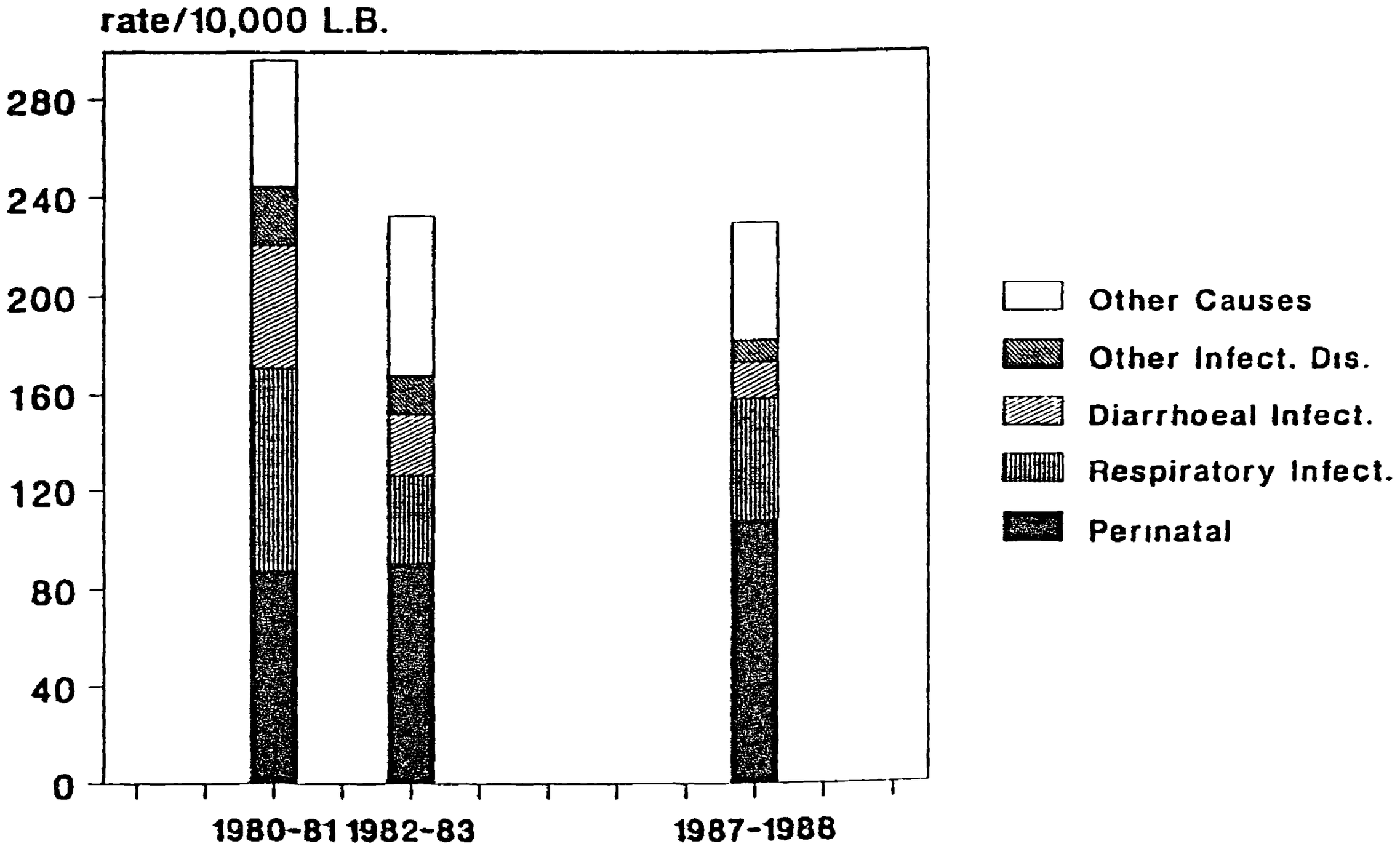


	80	81	82	83	84	85	86	87	88	89	90
IMR	28.7	27.5	22.9	23.2	26.2	20.6	23.1	20.7	20.2	19.4	22.5
CMR			2.1	1.3	2.2	1.5	1.4	1.4	1.4	1.5	

Source: Abstracts of Statistics
- IMR= deaths/1000 live births
- CMR= deaths/1000 population

FIGURE 4

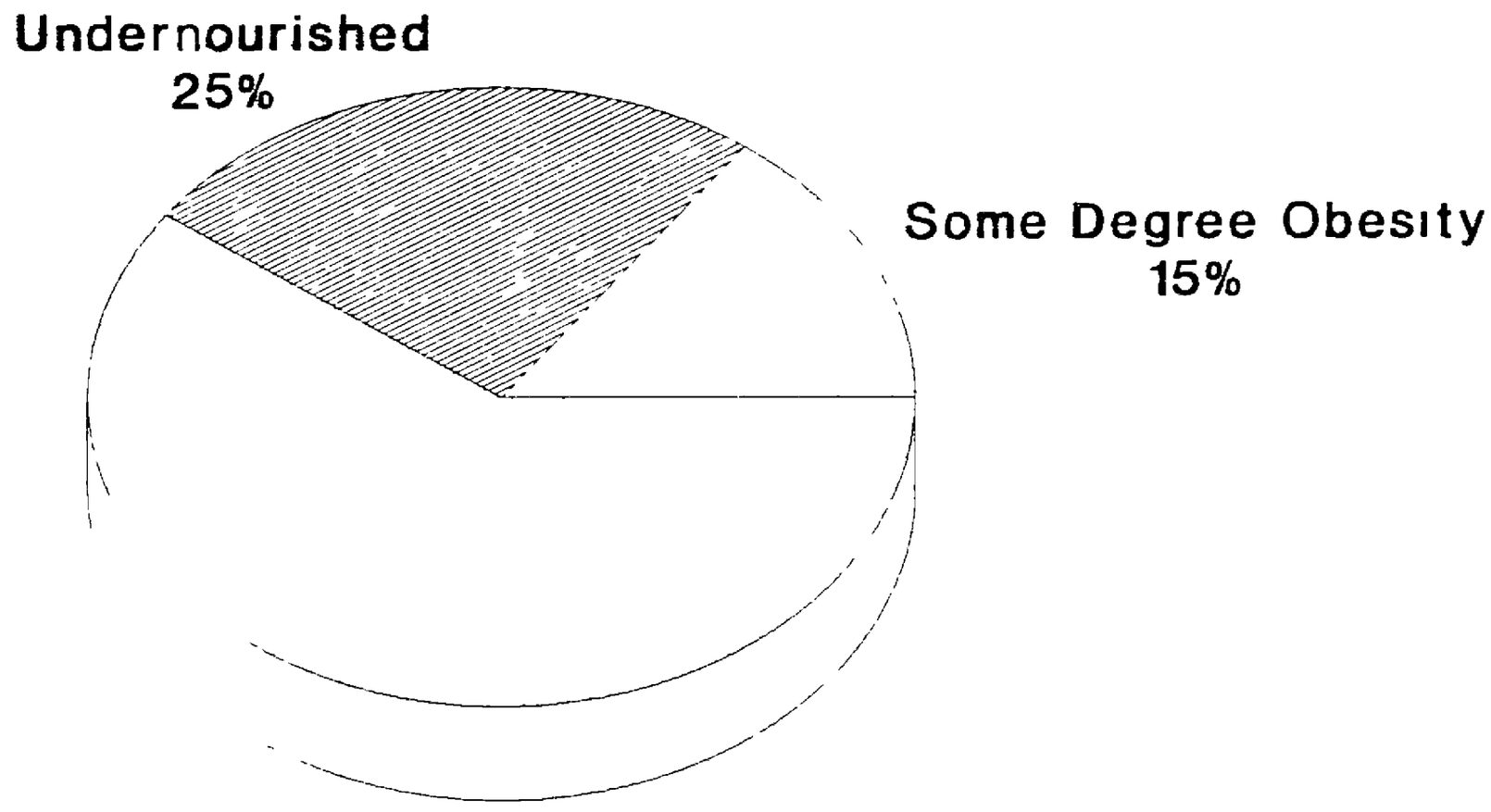
-BELIZE-
INFANT MORTALITY BY GROUPS OF CAUSES



Source: Mortalidad en la Ninez
INCAP, UNICEF, CELADE 1990

FIGURE 5

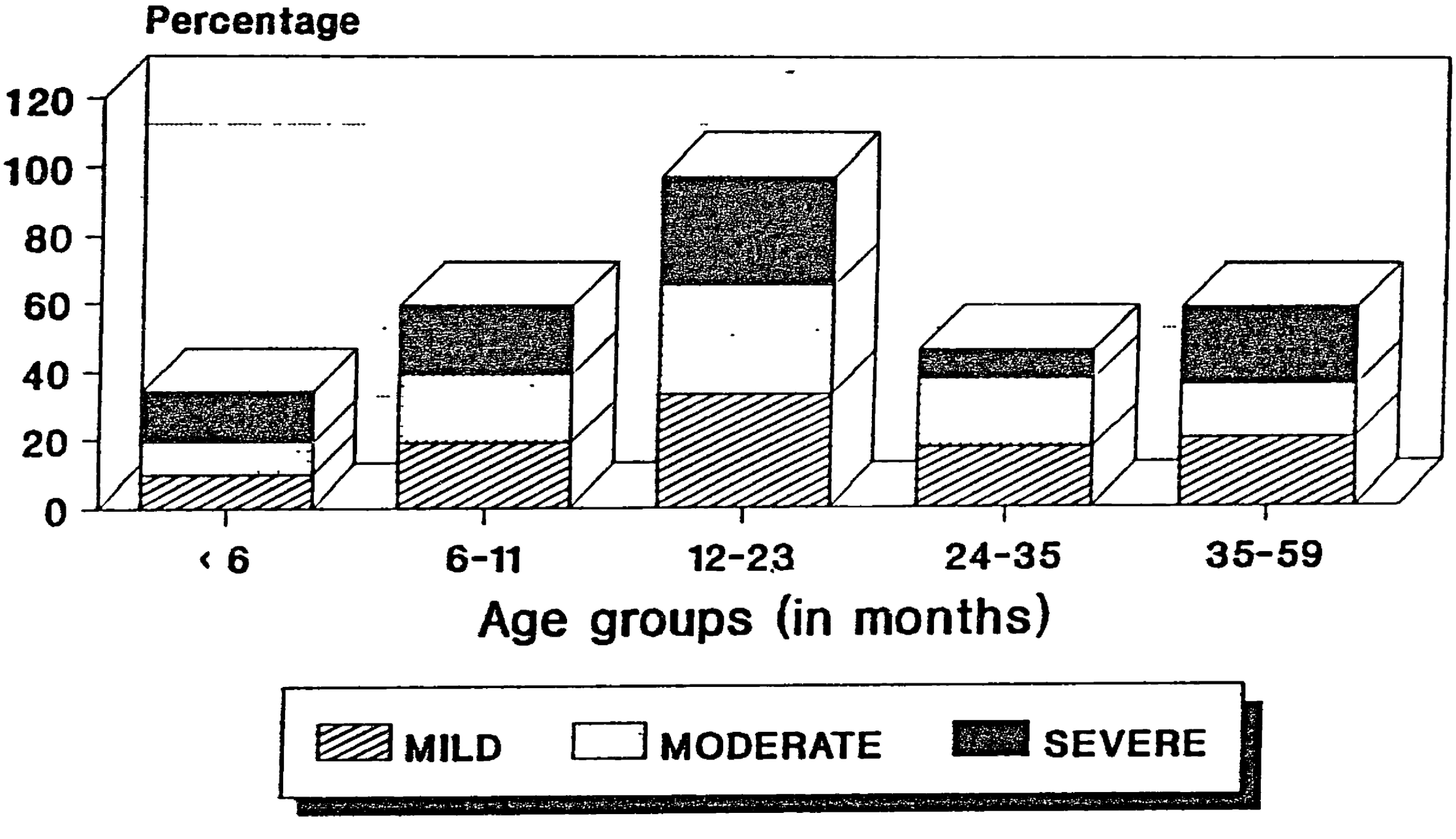
NUTRITIONAL STATUS OF CHILDREN UNDER 5 YEARS - WEIGHT-FOR-AGE INDICATOR Belize Jan-Mar 1992



Source BNAT., A Review of Growth Monitoring Data in Health Centers of Belize

FIGURE 6

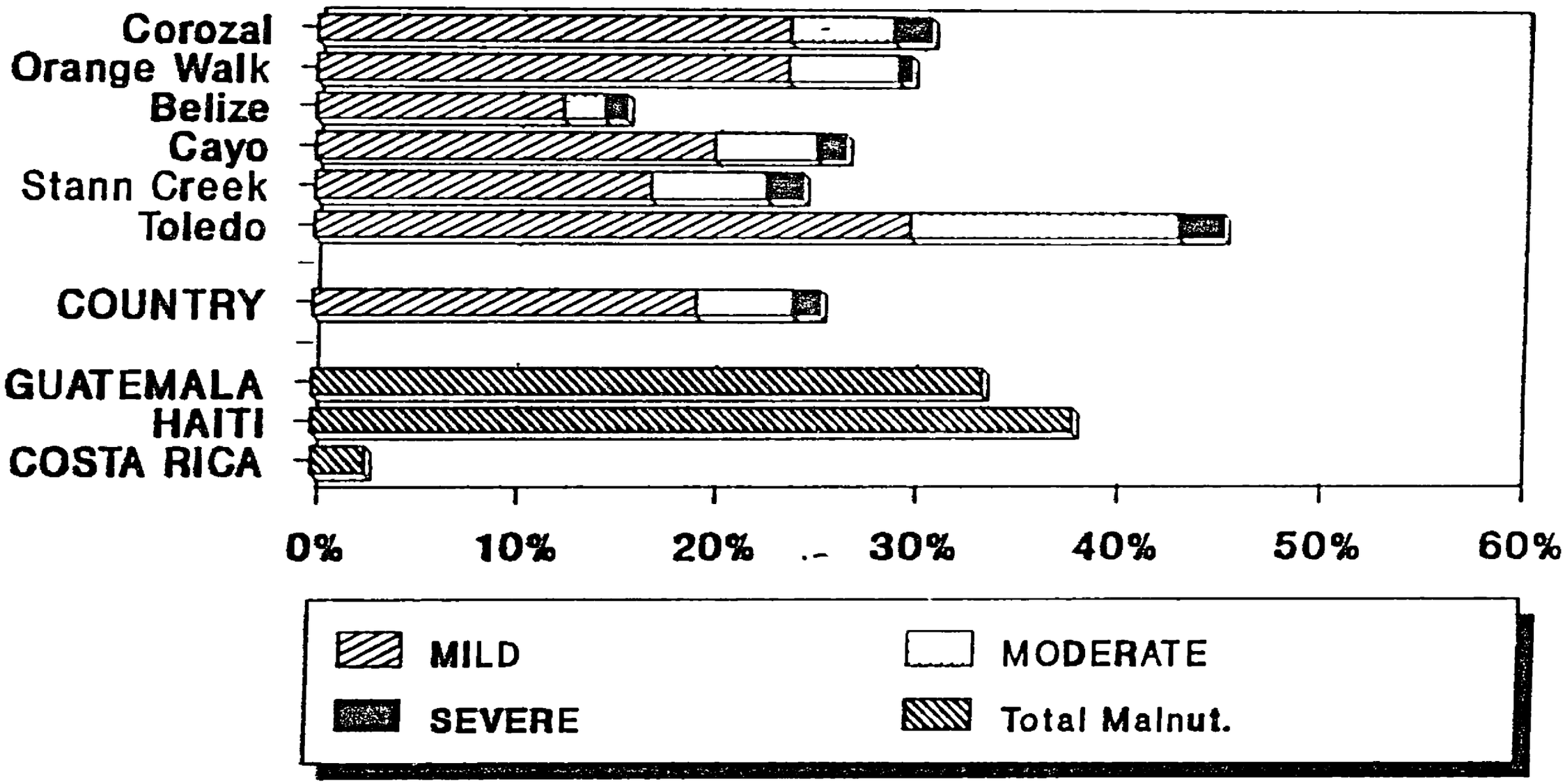
PERCENTAGE OF CHILDREN ‹ 5 YEARS WITH SOME DEGREE OF MALNUTRITION BY AGE GROUP USING WHO CLASSIFICATION - JAN-MAR 1992



Source: A Review of Growth Monitoring Data of Children under 5 Years in Health Centres of Belize.

FIGURE 7

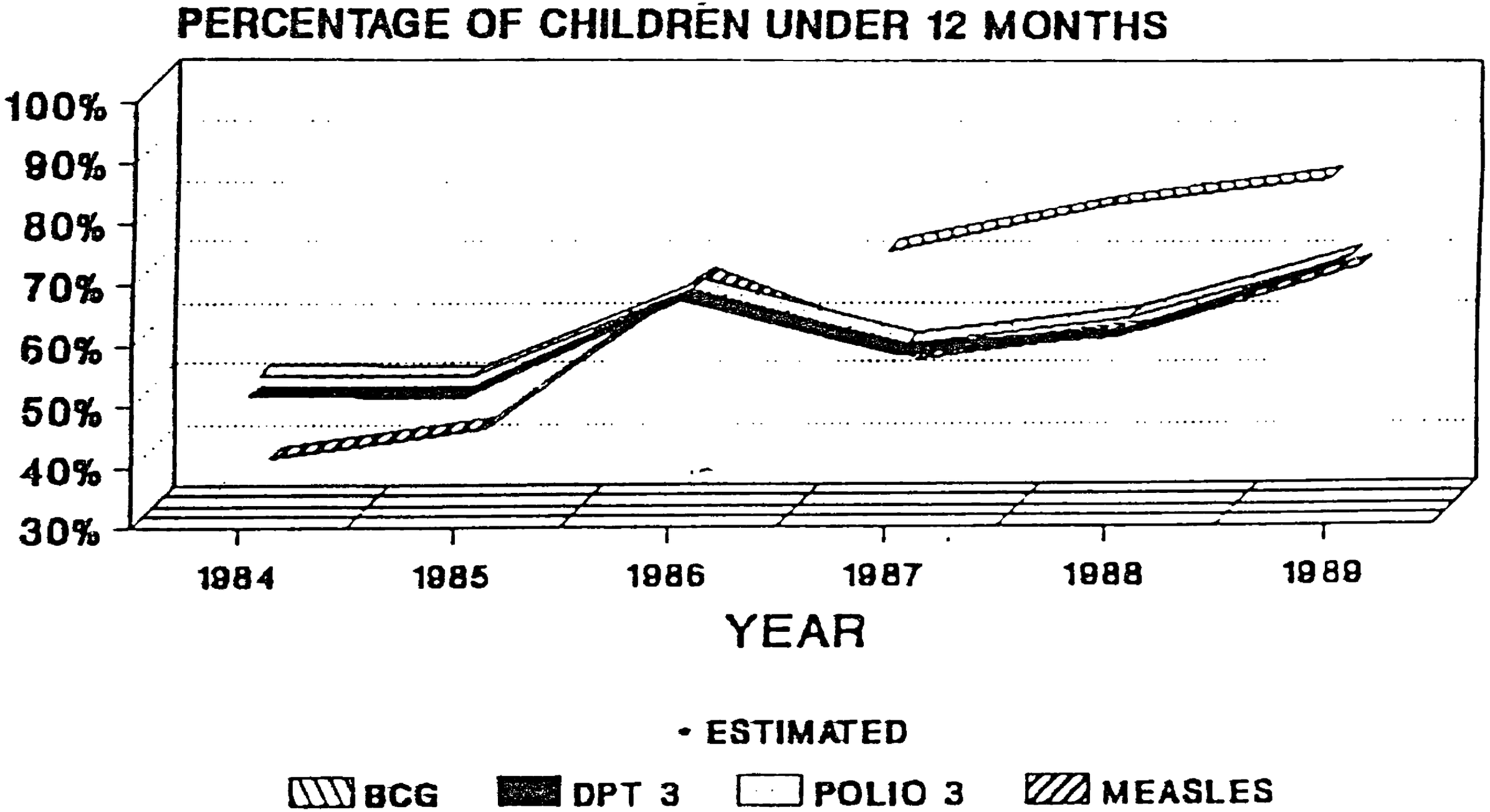
CHILDREN UNDER 5 YEARS WITH SOME DEGREE OF MALNUTRITION USING WHO CLASSIFICATION CUT-OFF POINT -1 SD. BELIZE JAN-MAR '92



Source:
-Health Centres Data. BNAT, 1992.
-Health Cond. in the Americas, WHO 1990.

FIGURE 8

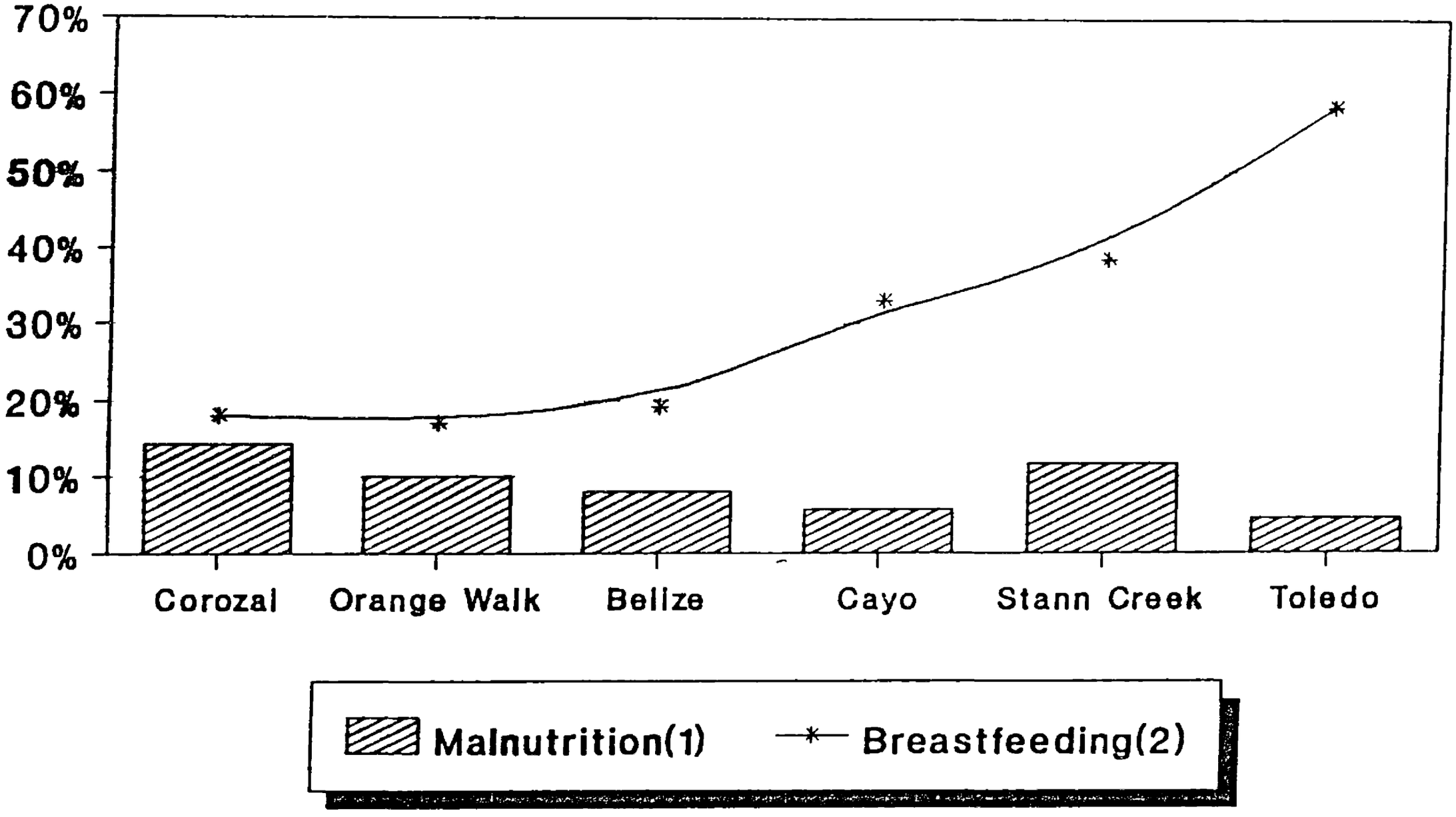
EPI COVERAGE
INMUNIZED CHILDREN UNDER 1 YEAR
BELIZE, 1984-1989



Source: Medical Statistical Office
MCH Program

FIGURE 9

MALNUTRITION IN CHILDREN ‹6 MONTHS AND EXCLUSIVE BREASTFEEDING BELIZE 1991

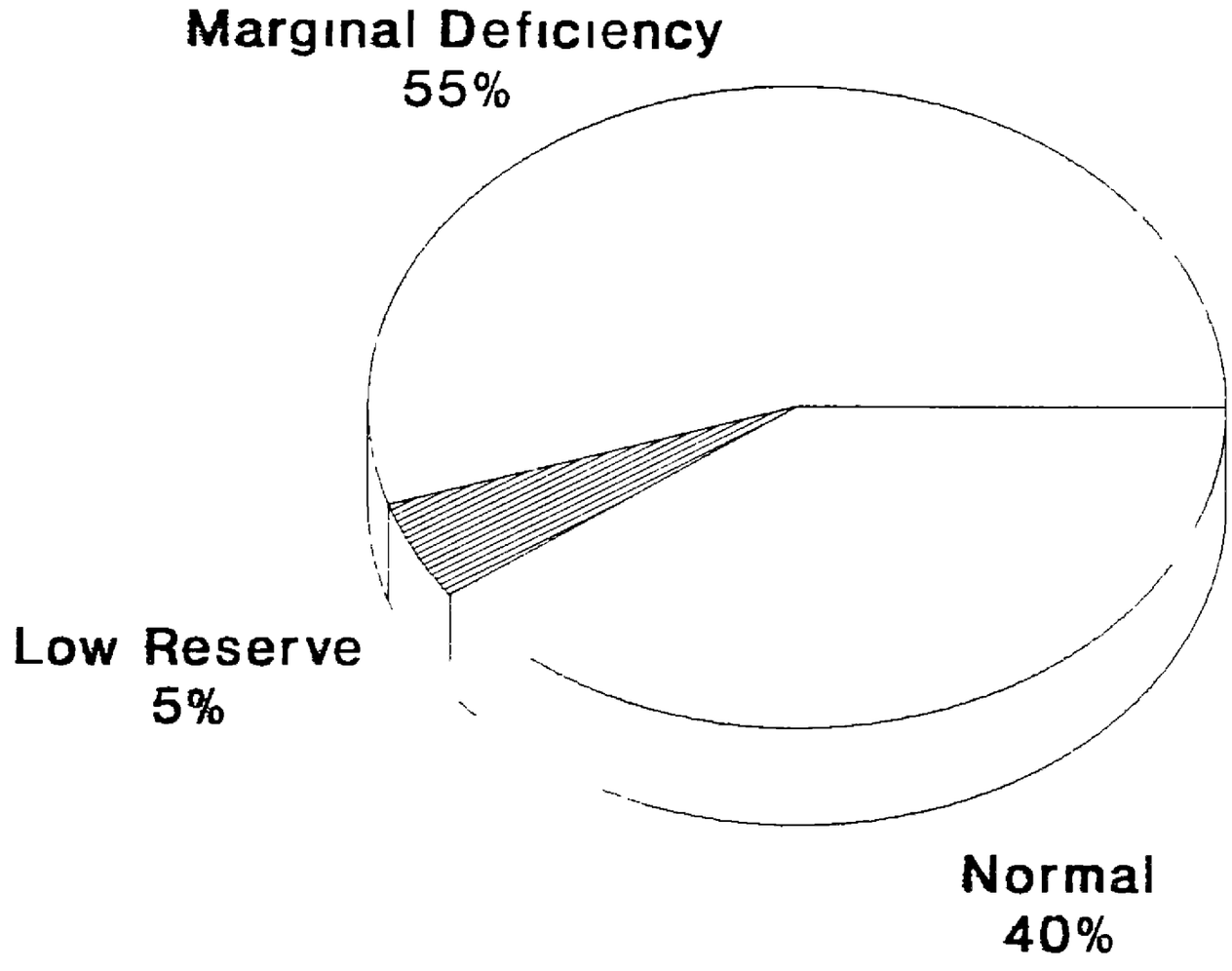


• Expressed as a percentage of children ‹ 1 year registered in the Clinics

Source:1.)BNAT Study 2.)MCH Report,1991

FIGURE 10

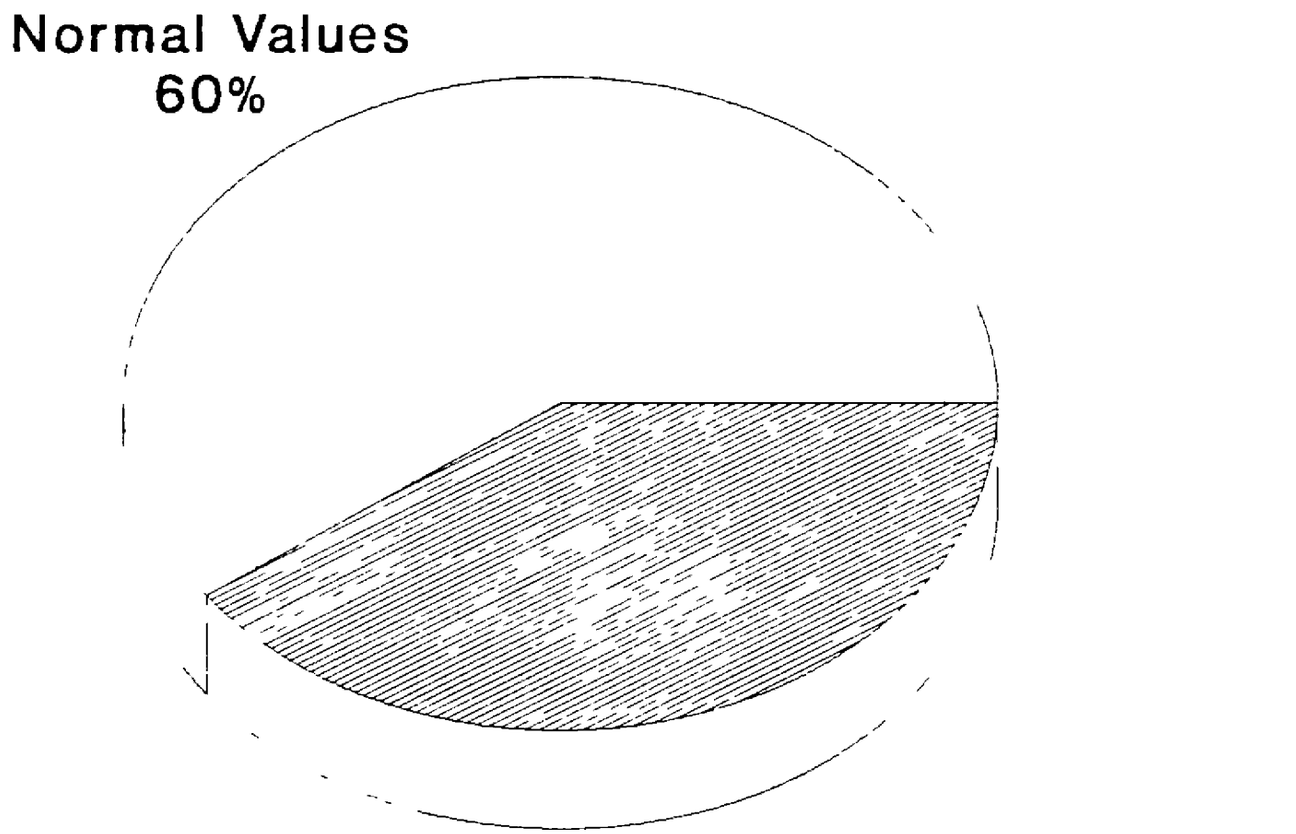
STATUS OF VITAMIN A IN CHILDREN BELIZE 1989



Source: An Assessment of the Vitamin A status in the Children of Belize, 1989. Lincoln University

FIGURE 11

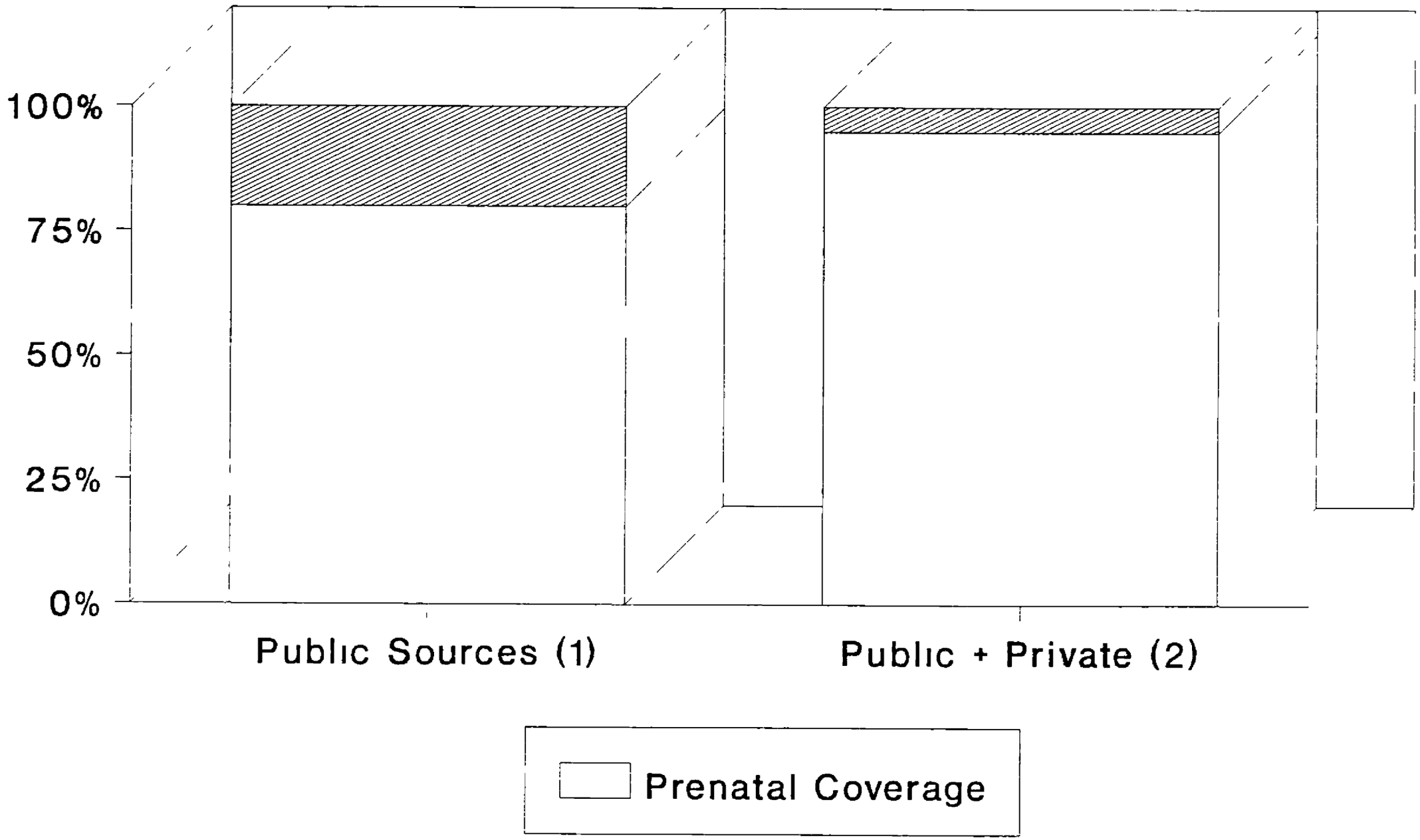
ZINC STATUS IN CHILDREN BELIZE 1989



Source An Assessment of the Vitamin A status in the Children of Belize, 1989
Lincoln University

FIGURE 12

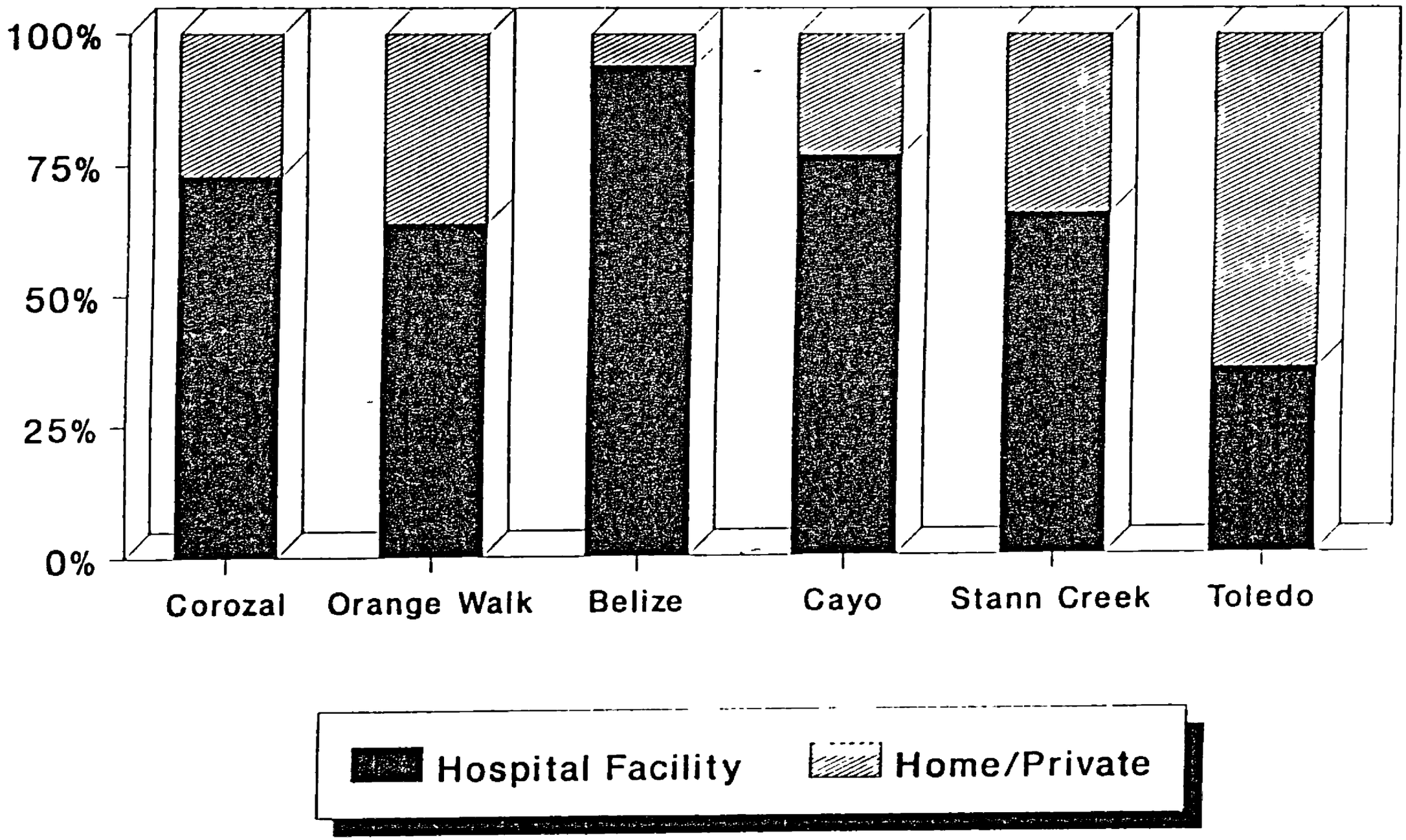
PERCENTAGE OF PRENATAL COVERAGE BELIZE 1991



Sources (1) MCH Programme, MOH.
(2) Family Health Survey, 1991

FIGURE 13

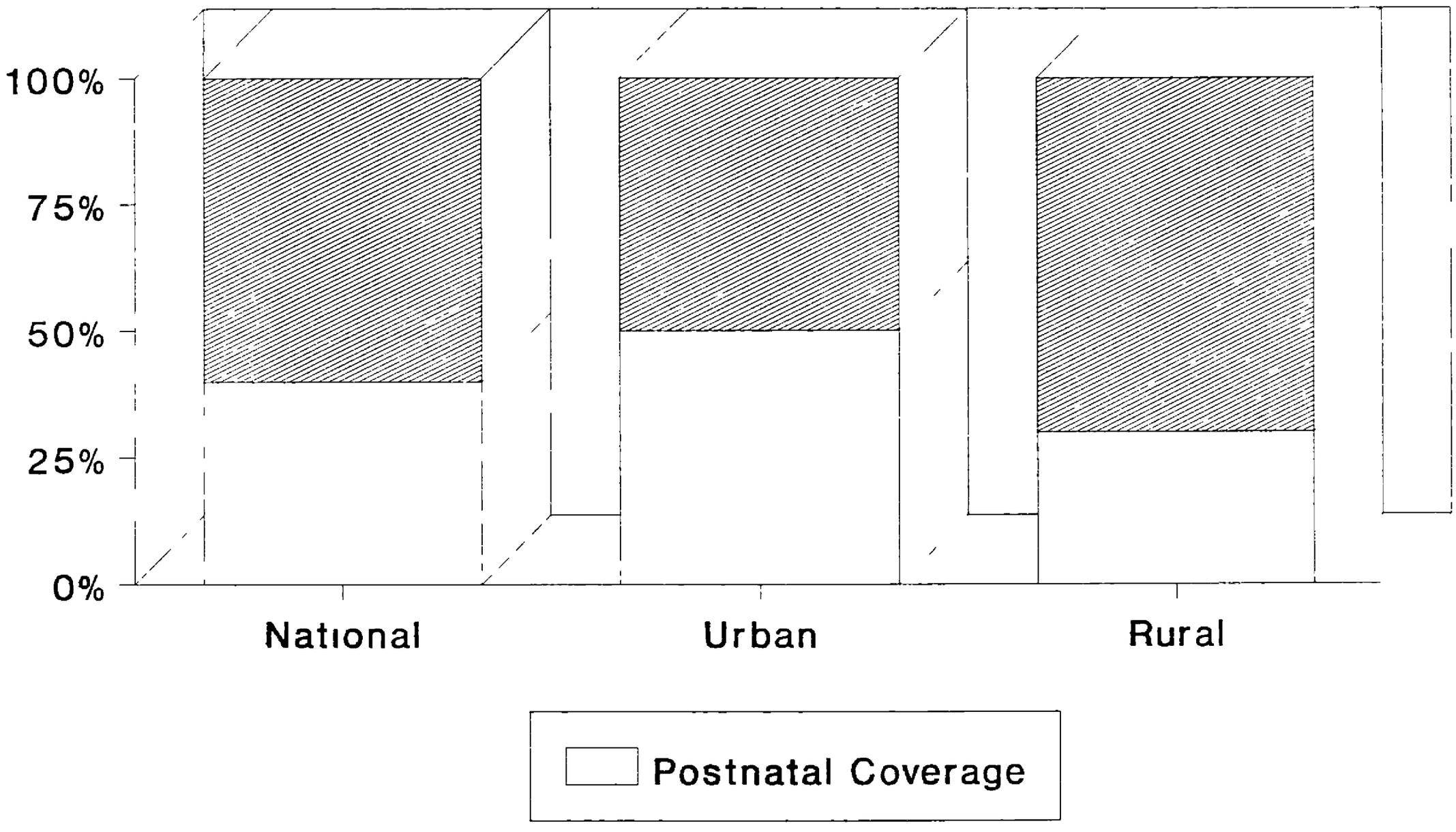
Deliveries by type of attention received by district - Belize 1991



MCH programme
Ministry of Health

FIGURE 14

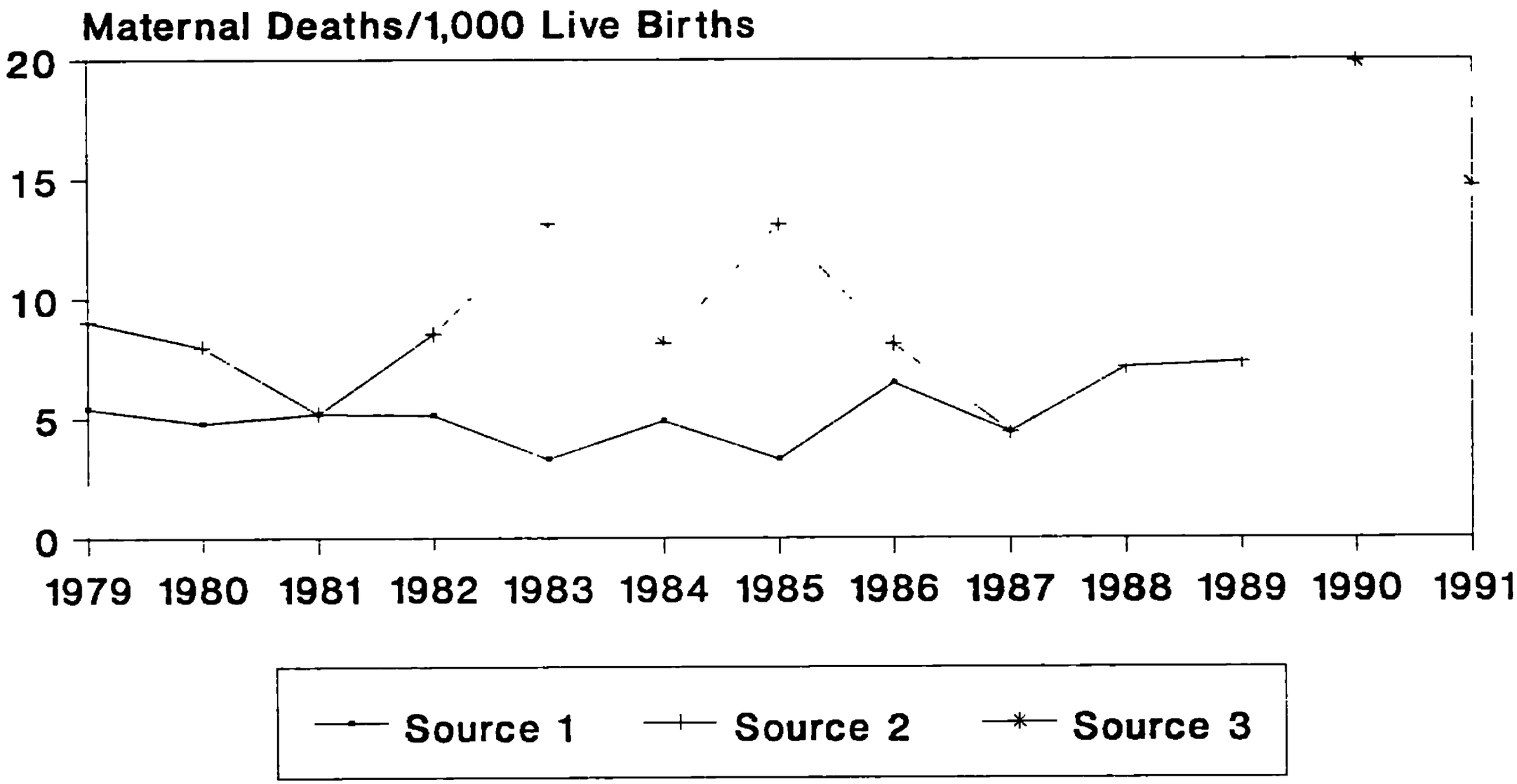
POSTNATAL COVERAGE BY THE PUBLIC HEALTH SERVICE BELIZE, 1991



Source. MCH Programme, MOH

FIGURE 15

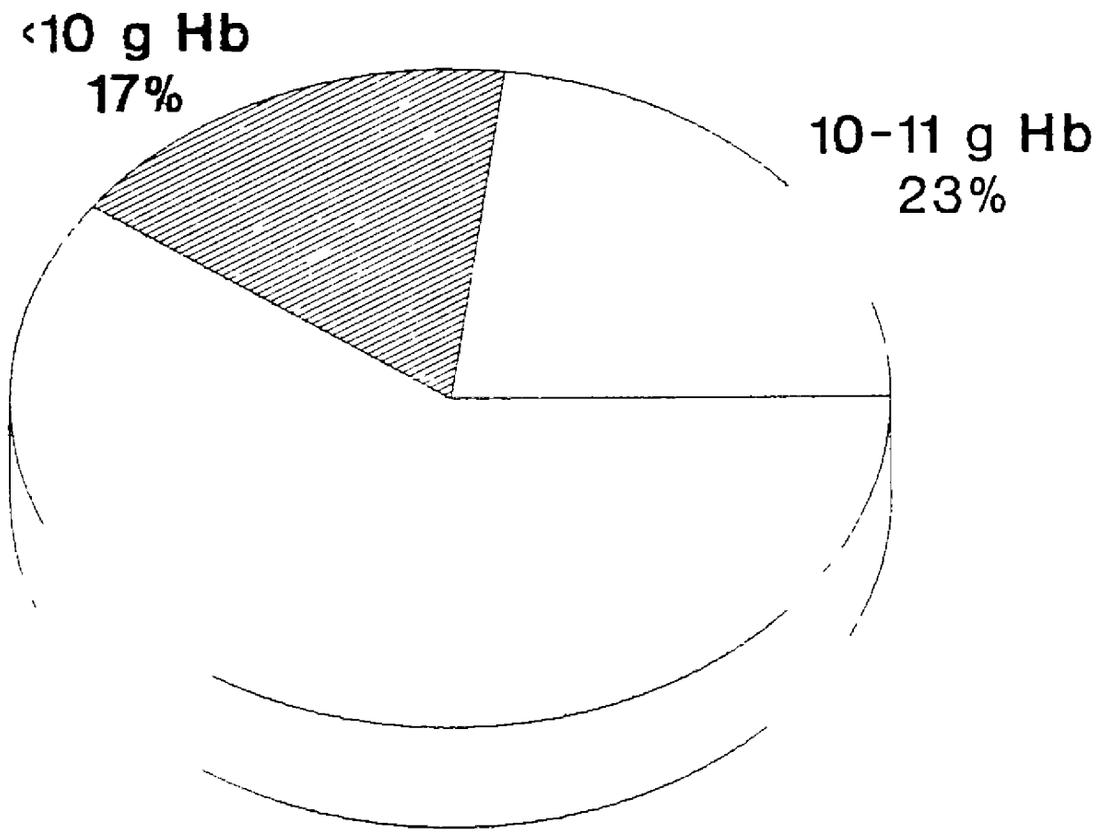
MATERNAL MORTALITY IN BELIZE
1979 - 1991
(Rates from different sources)



Sources: (1) Abstracts of Statistics
(2) Smith, F. "MMR Review, 1990
(3) Moguel, A. "MMR Review, 1990, 1991"

FIGURE 16

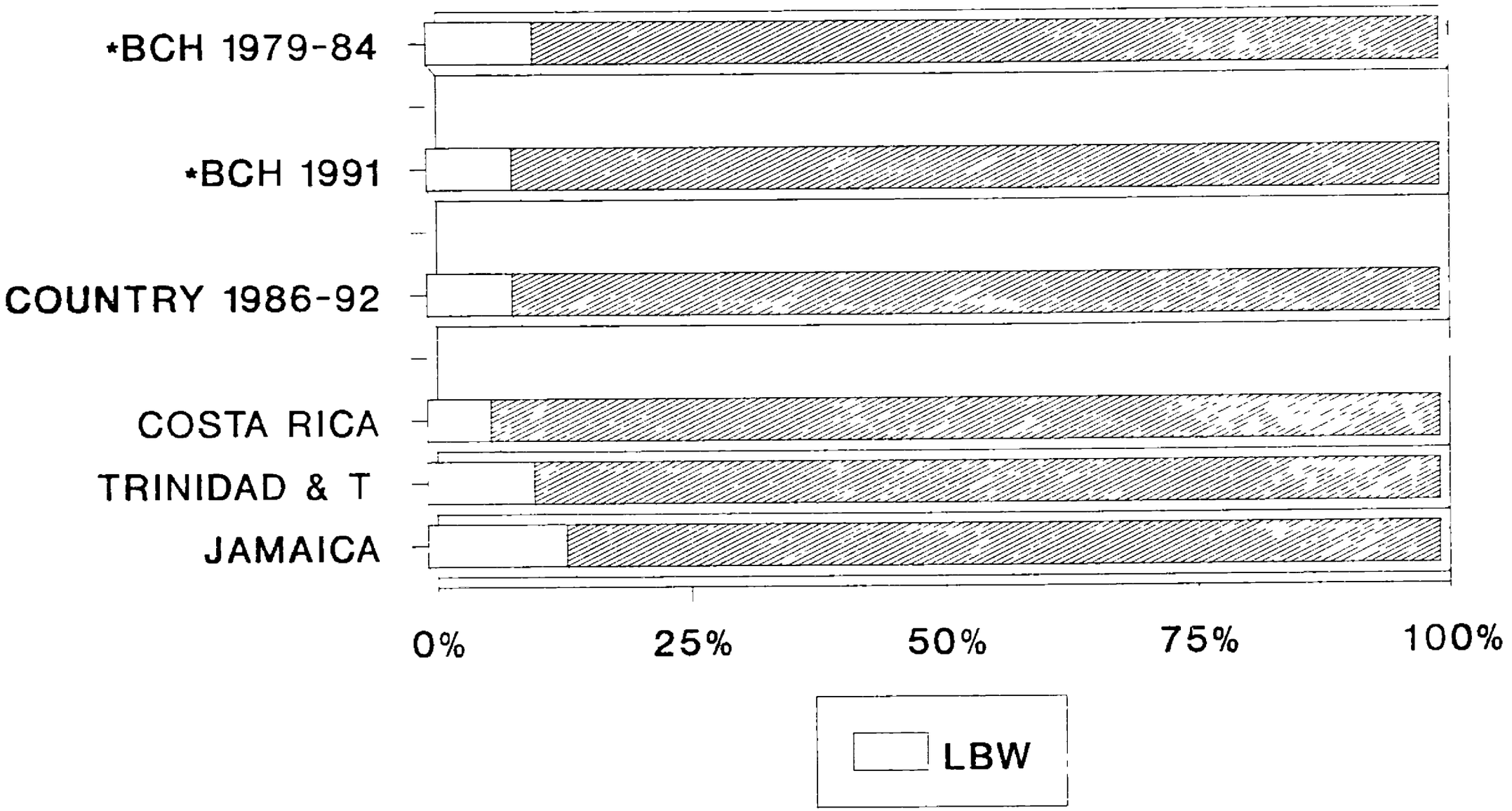
PREVALENCE OF ANAEMIA IN PREGNANT WOMEN ATTENDING HEALTH CLINICS BELIZE 1988



Source Hof, A. Survey of Anaemia in Pregnant Women Ministry of Health, 1989

FIGURE 17

INCIDENCE OF LOW BIRTH WEIGHT
(Different Sources)

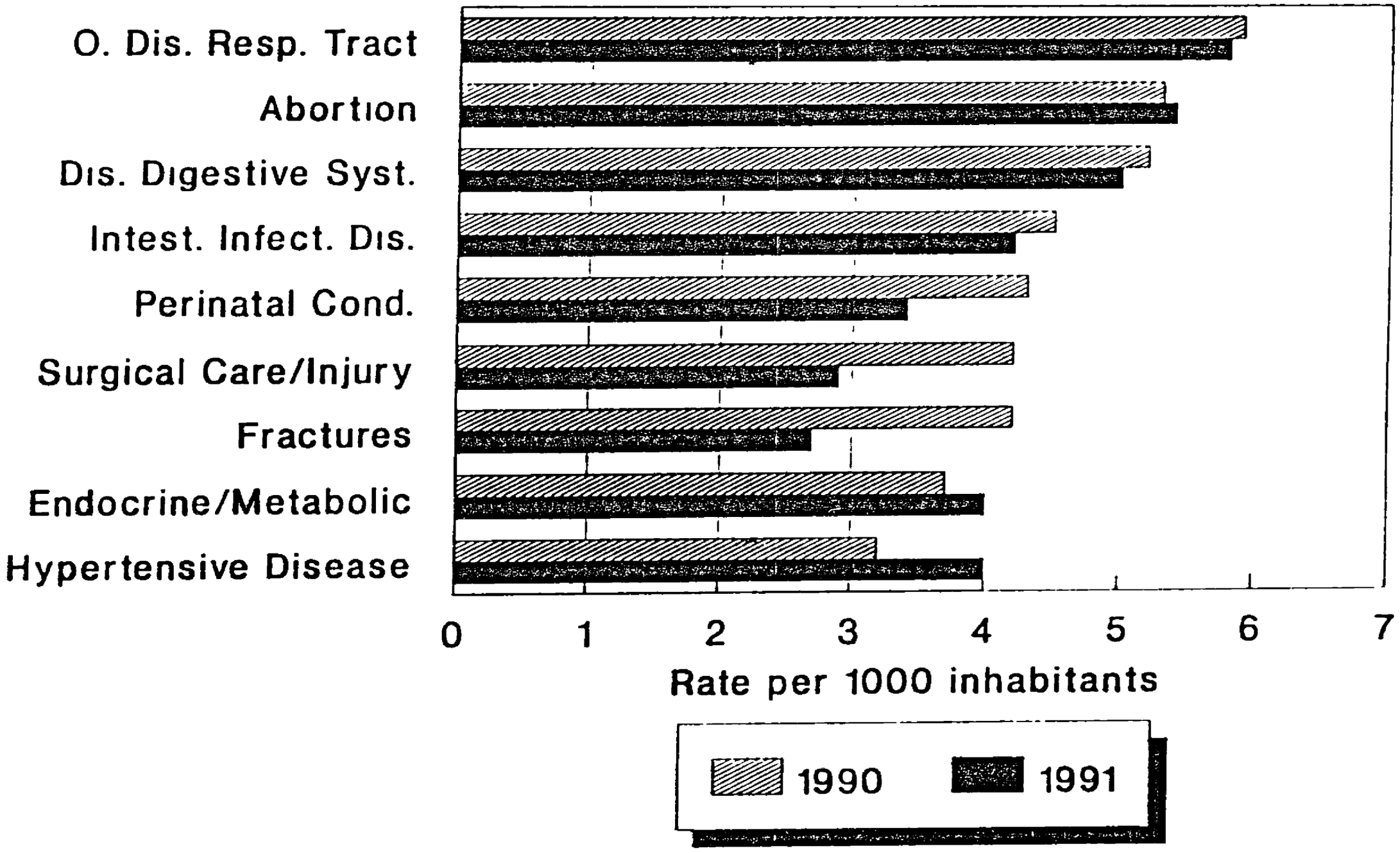


Sources Farnum, S Assessment Report
Medical Statistics Office Child Clinics
Data Health Conditions in the Americas

*BCH Belize City Hospital

FIGURE 18

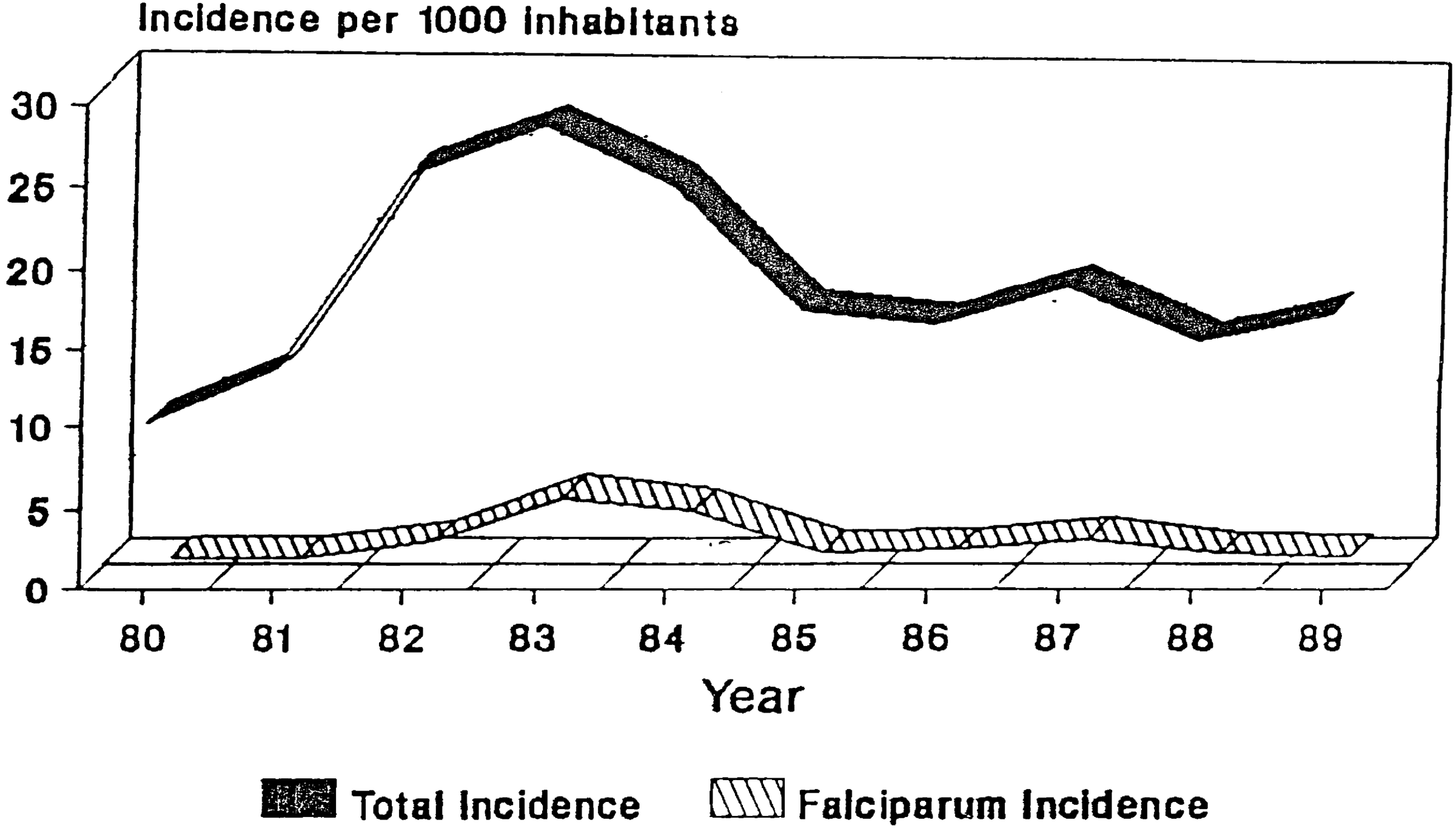
PRINCIPAL CAUSES OF HOSPITALIZATION BELIZE 1990-1991



Source: Medical Statistical Office

FIGURE 19

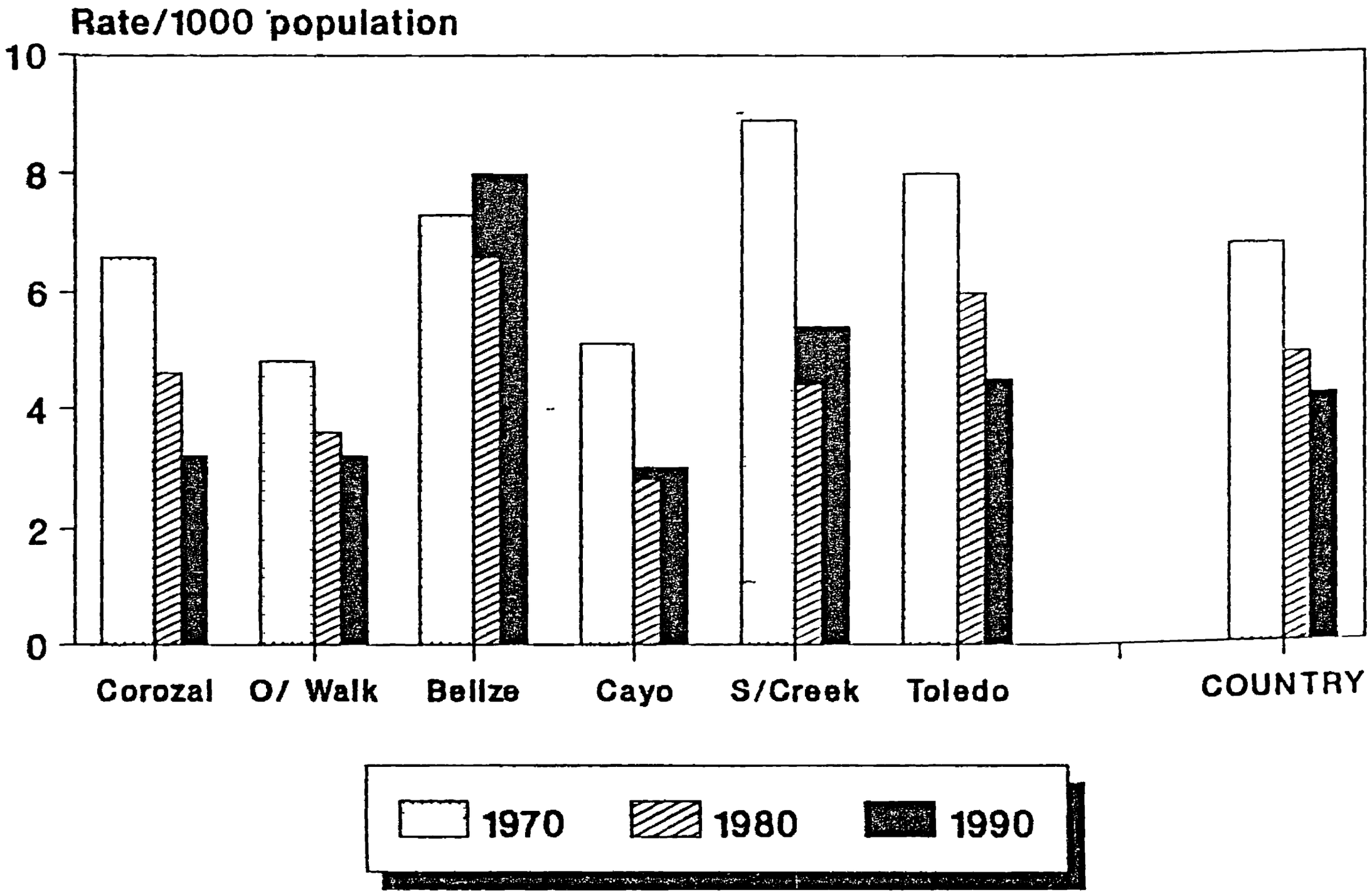
MALARIA INCIDENCE
BELIZE, 1980-1989



Source: Status of Malaria Programs in the Americas, PAHO-WHO, 1989. And Malaria Office

FIGURE 20

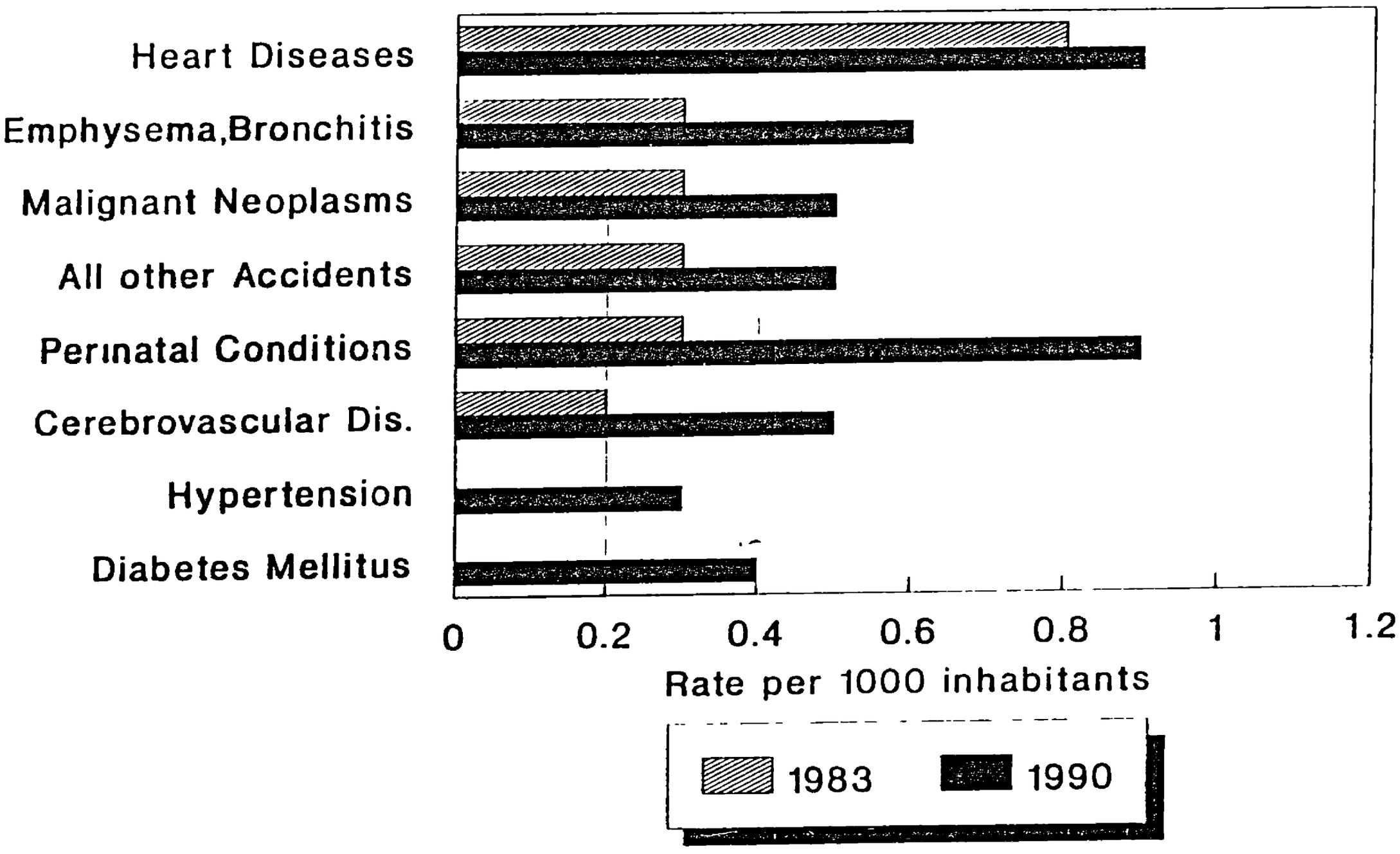
General Mortality Rates by District Belize 1970, 1980 and 1990



Source: Abstract of Statistics 1991

FIGURE 21

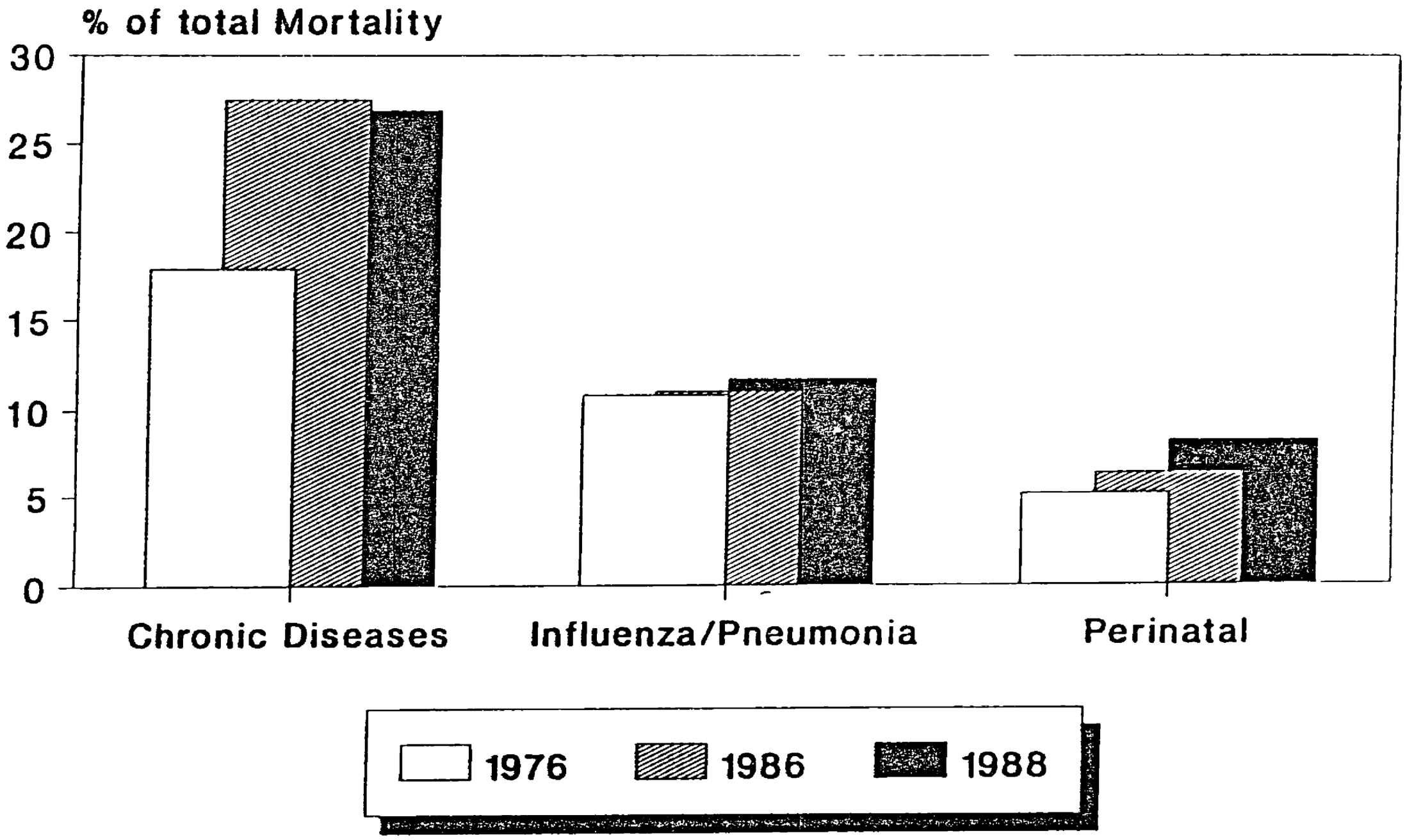
PRINCIPAL CAUSES OF DEATH BELIZE 1983-1990



Source: Medical Statistical Office

FIGURE 22

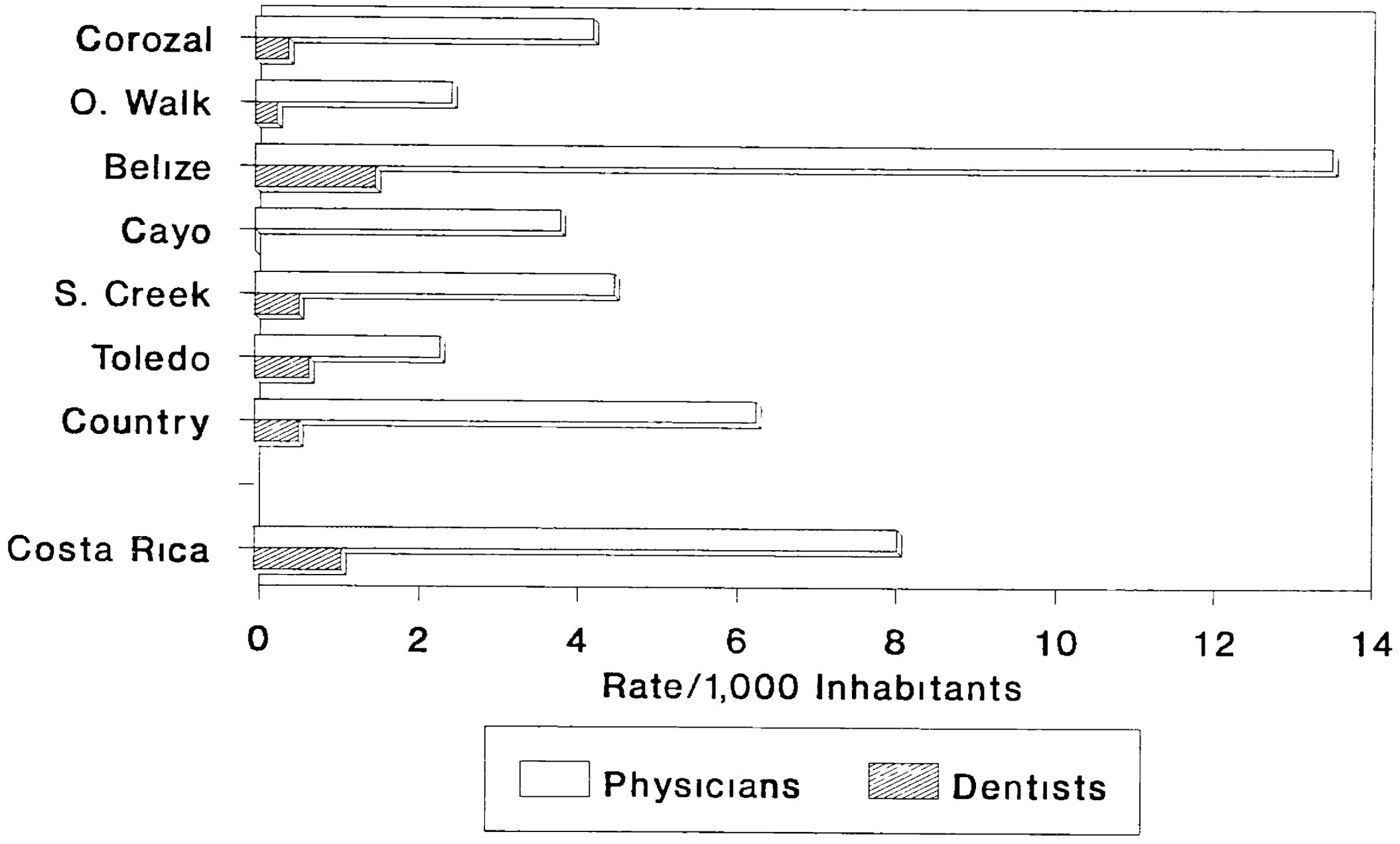
Changing Patterns of Mortality in Belize 1976, 1986 and 1988



1)Health Conditions in the Americas 1973-1976 and 1990. PAHO
2)NHPS, Ministry of Health, Belize, 1990

FIGURE 23

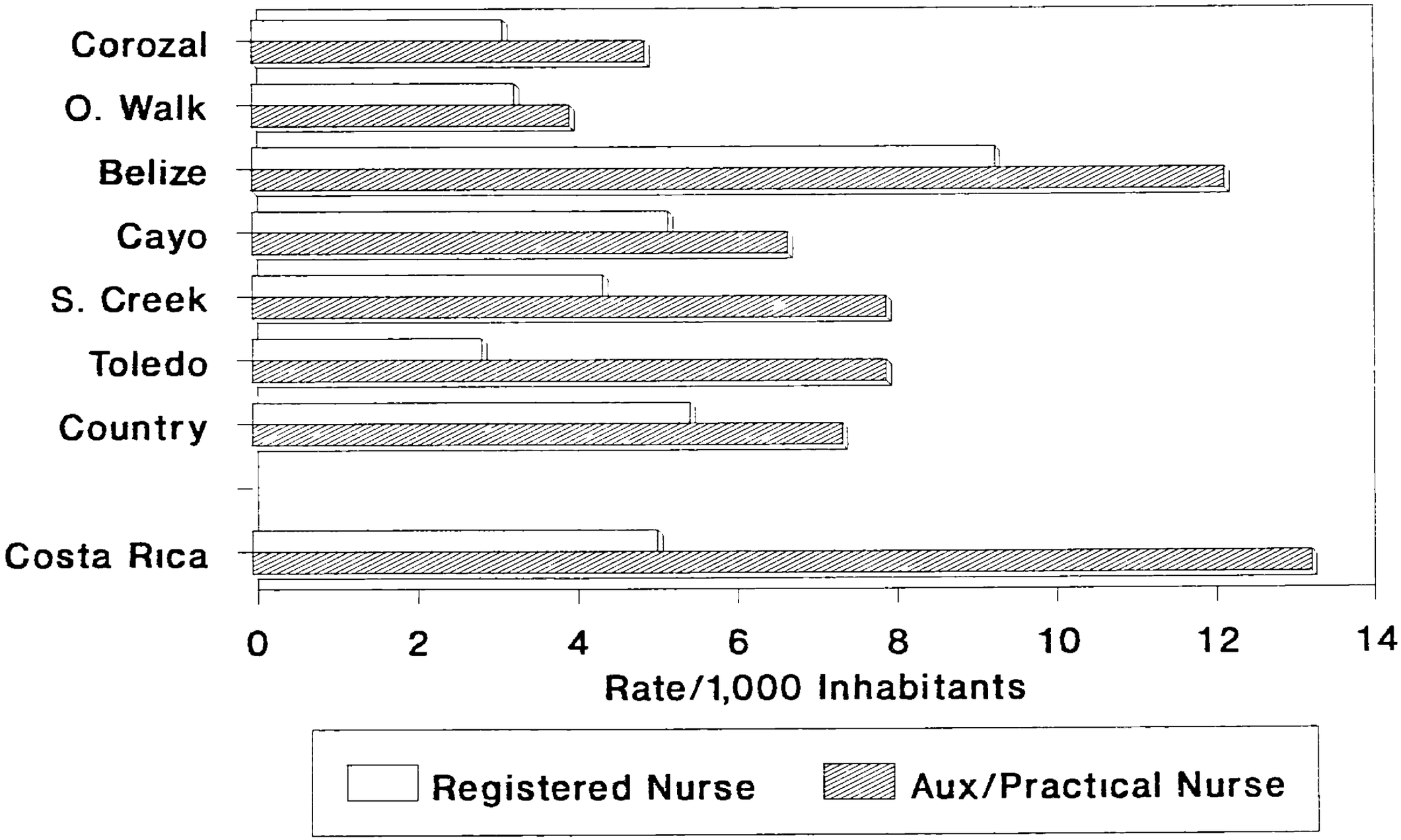
PHYSICIANS AND DENTISTS RATES BY DISTRICT, 1992



Source: Medical Department. MOH

FIGURE 24

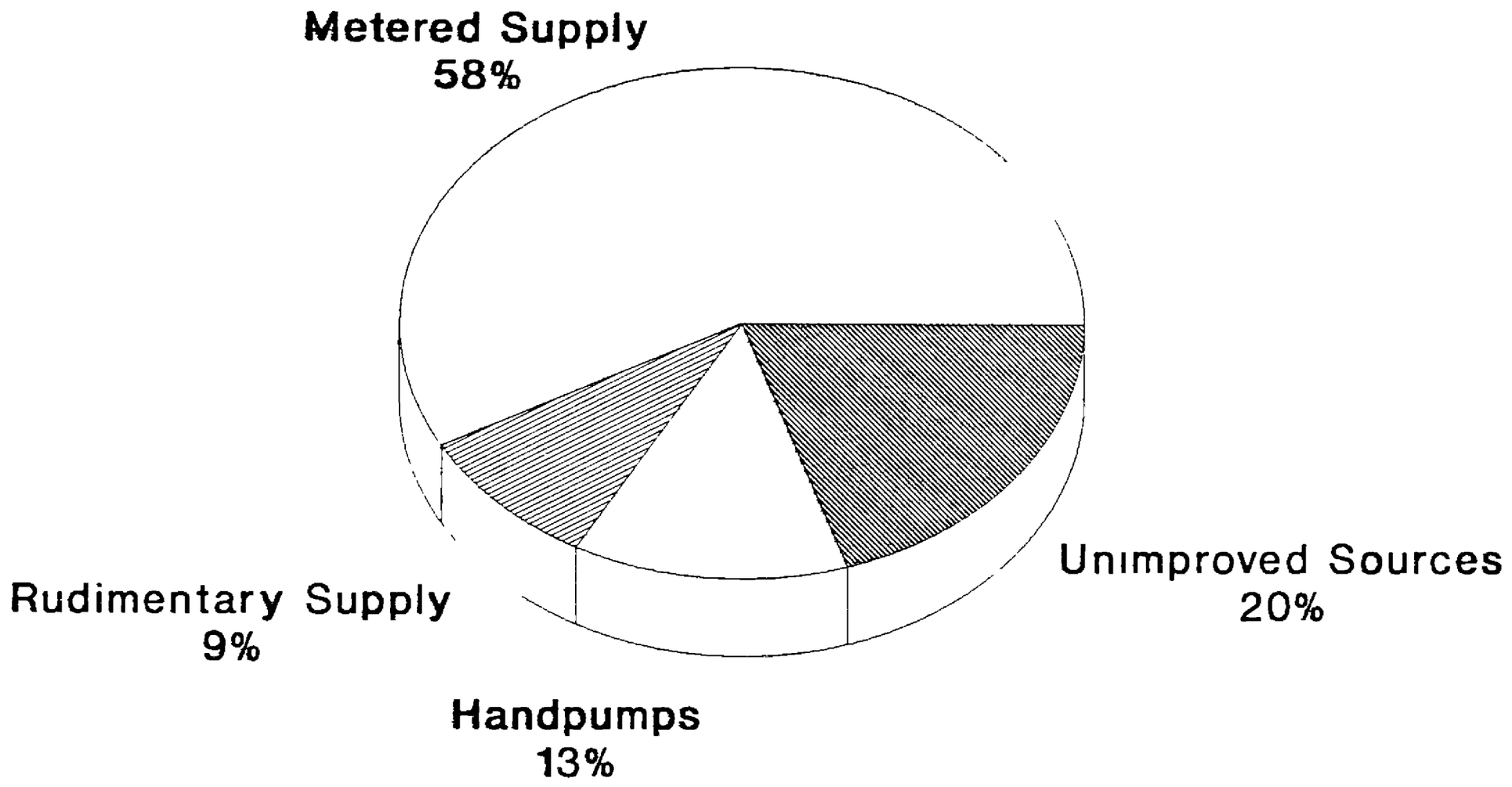
NURSING PERSONNEL BY DISTRICT BELIZE 1992



Source: Medical Department. MOH.

FIGURE 25

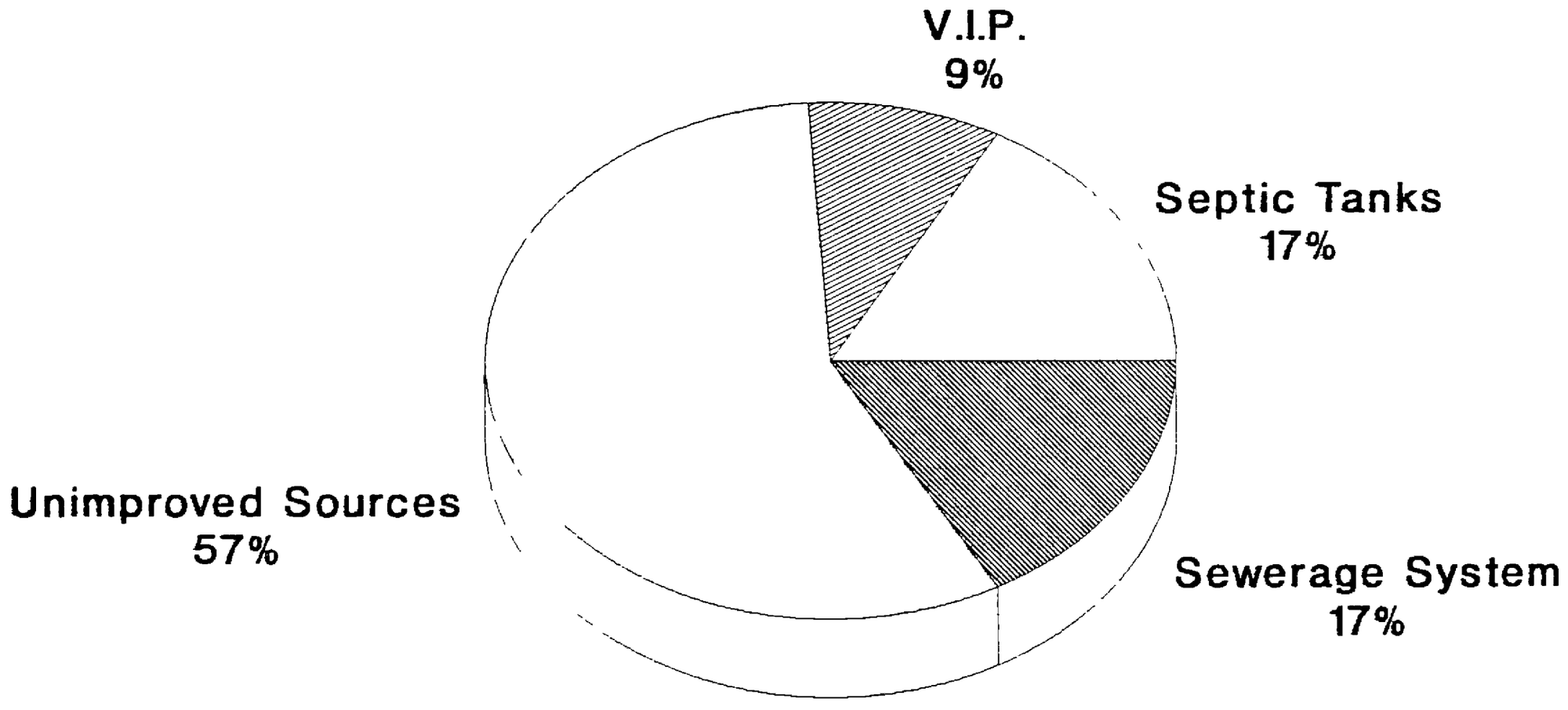
PERCENTAGE OF POPULATION WITH ACCESS TO WATER BY TYPE OF SYSTEM BELIZE 1990



Source: WASA

FIGURE 26

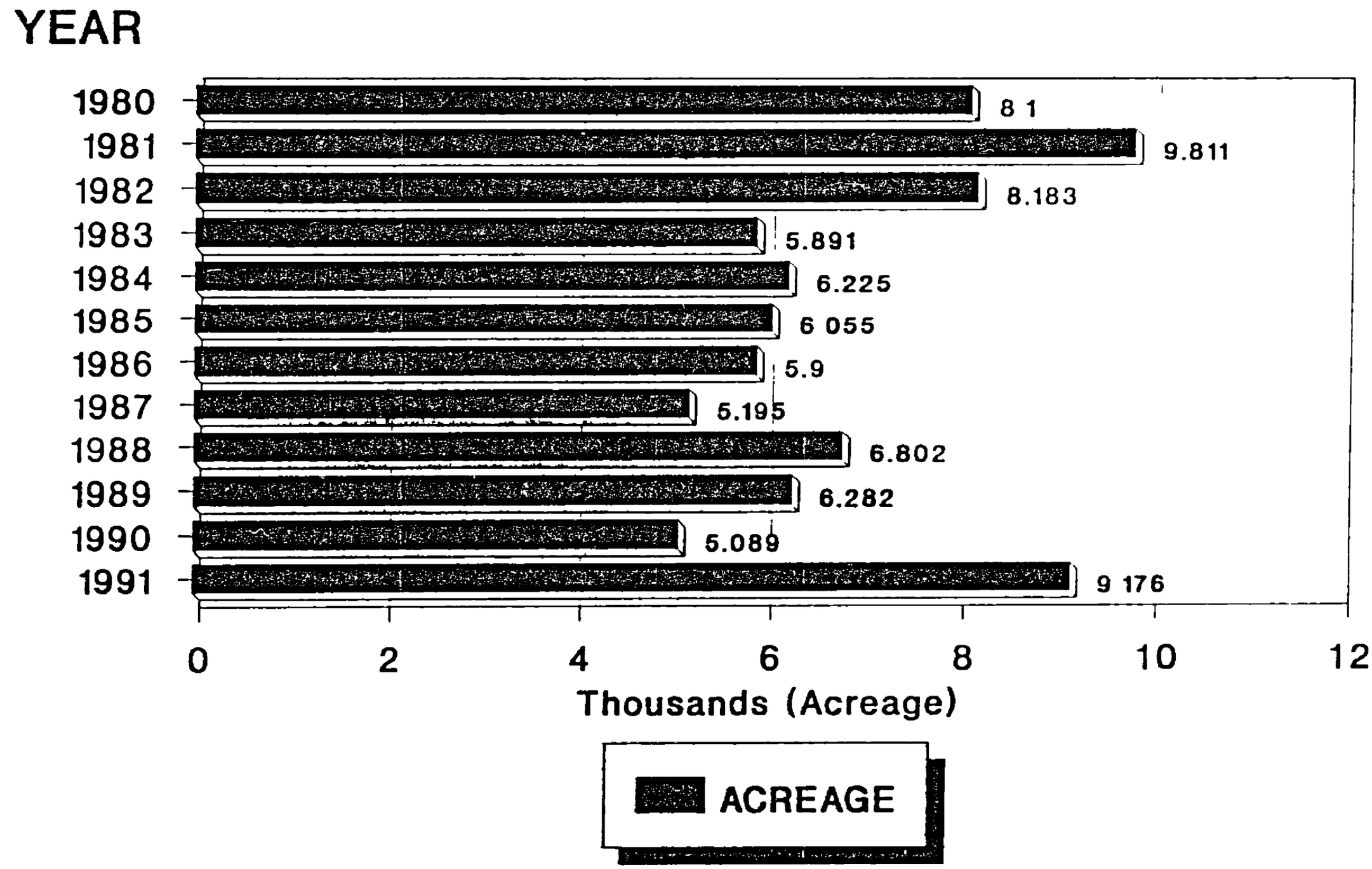
SANITATION STATUS BY TYPE OF FACILITIES BELIZE 1990



Source: WASA

FIGURE 27

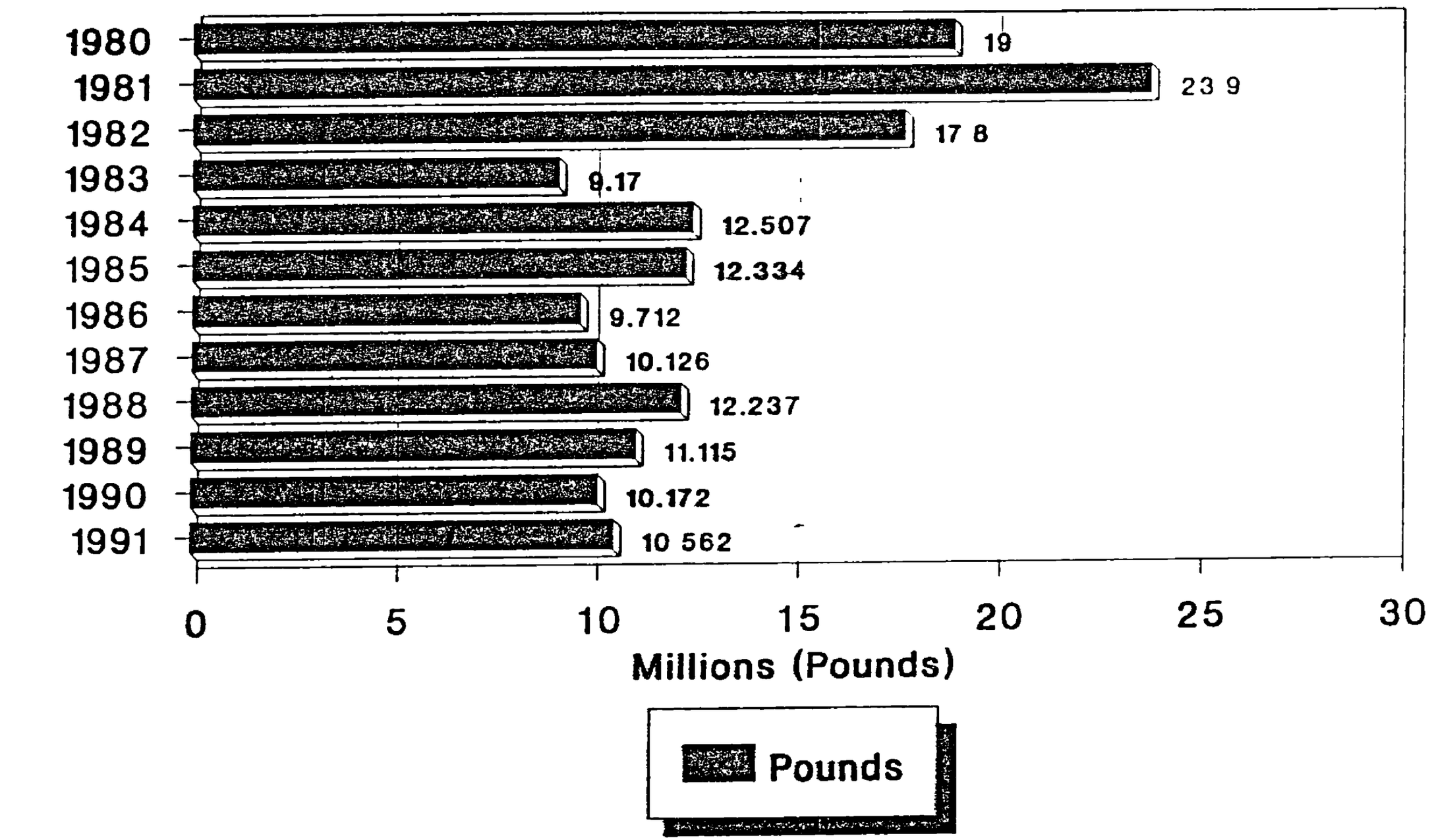
ACREAGES ON RICE
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 28

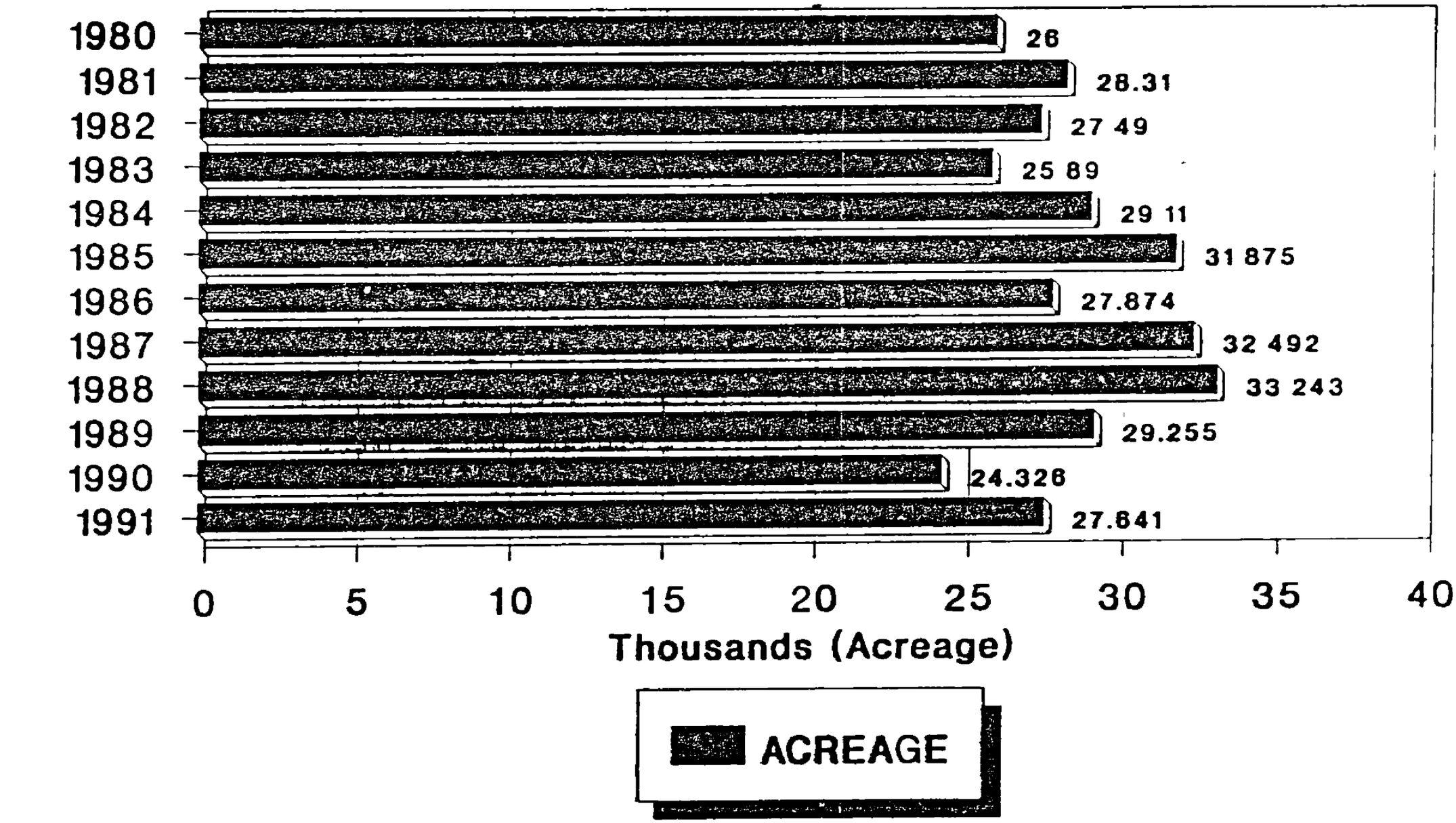
RICE PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 29

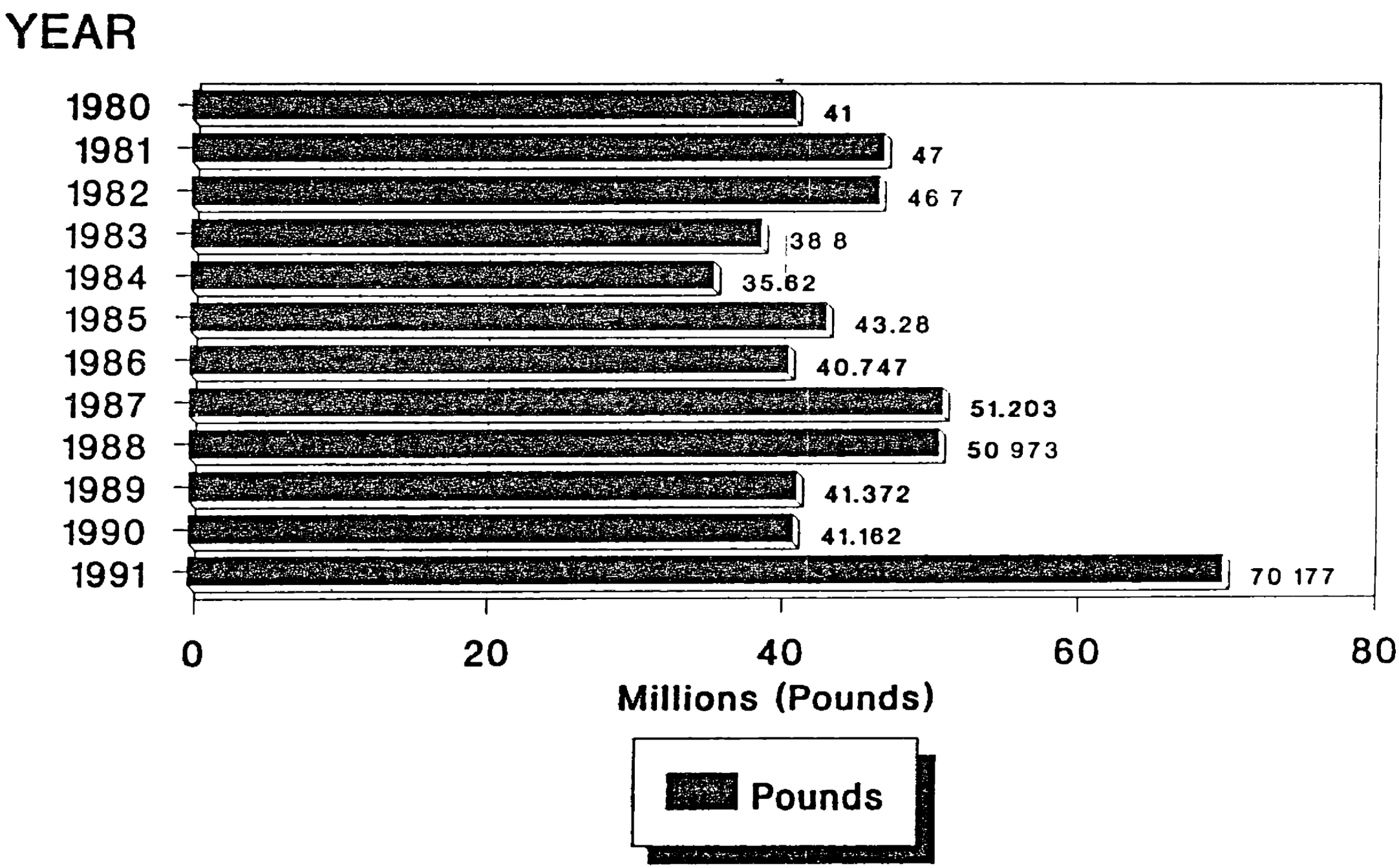
ACREAGES ON CORN
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 30

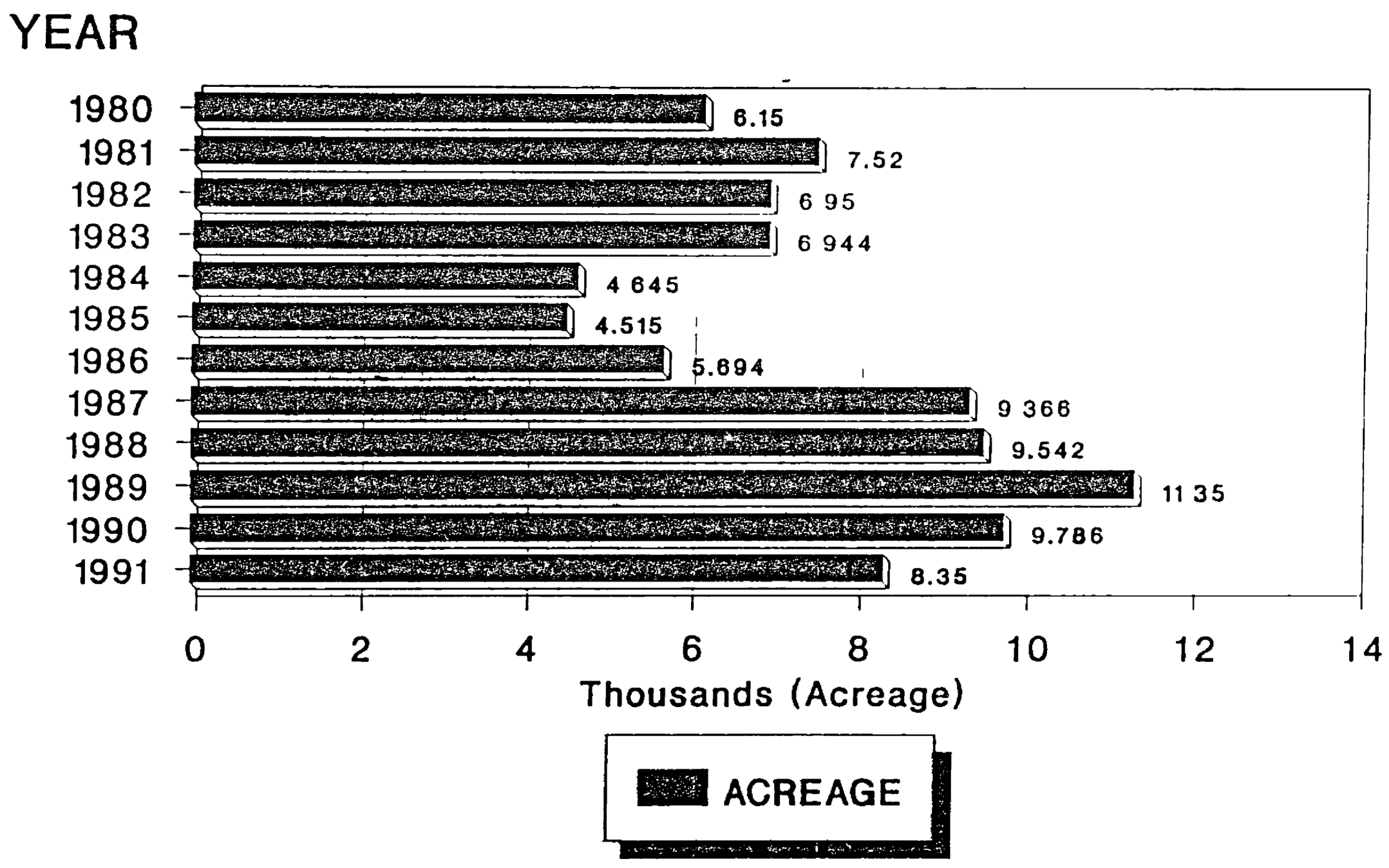
CORN PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 31

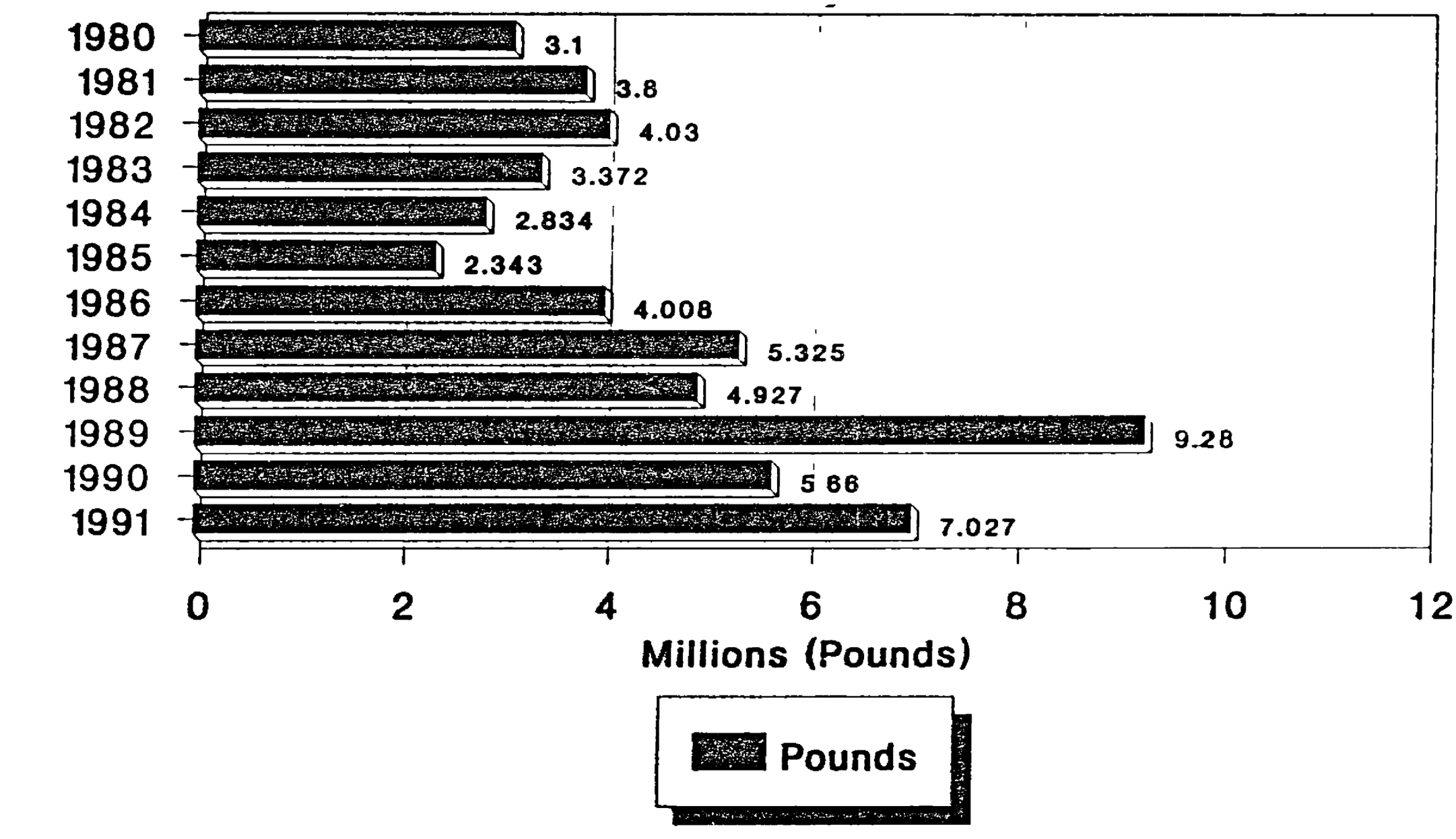
ACREAGES ON R.K.BEANS
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 32

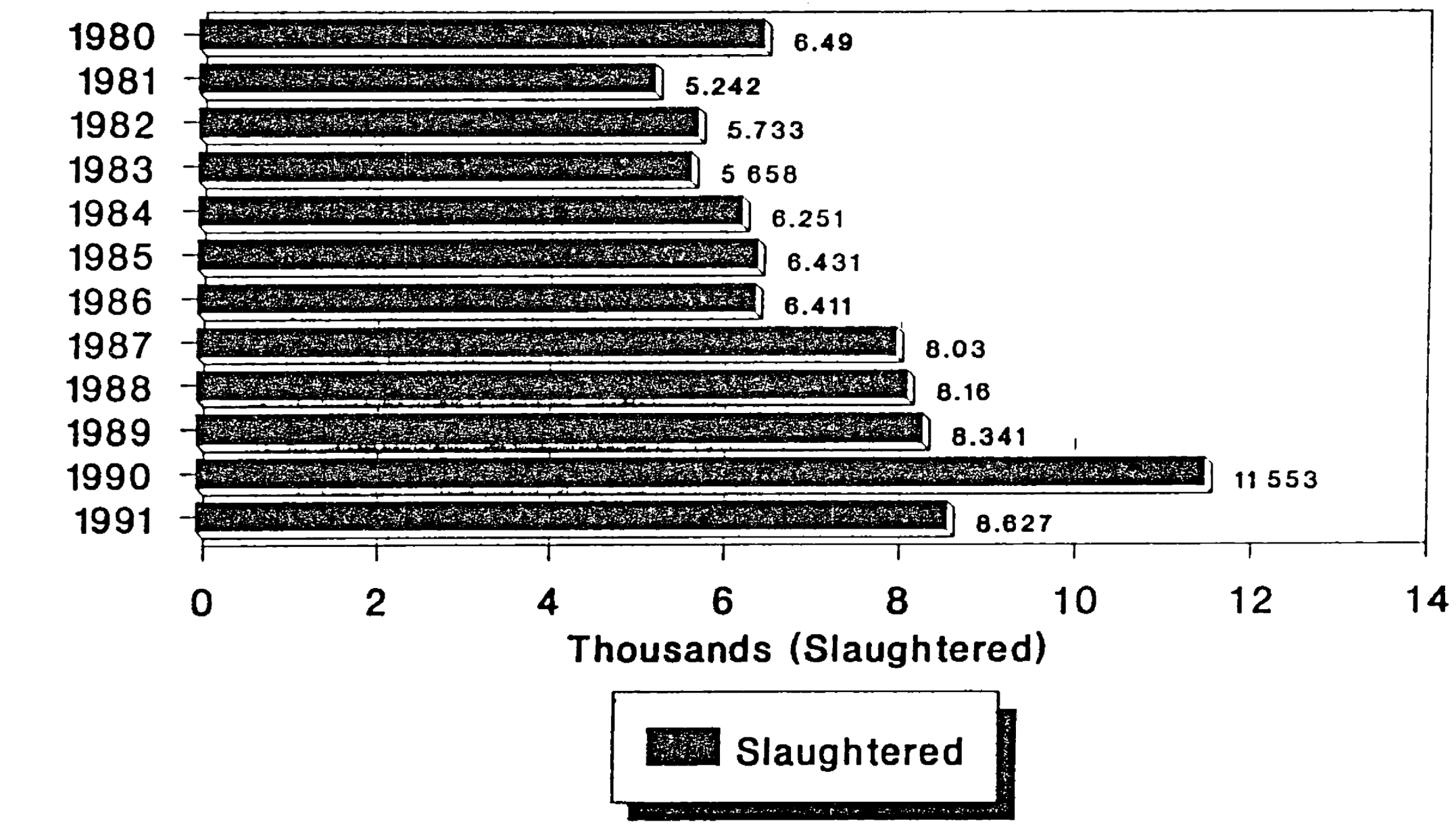
R.K.BEANS PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 33

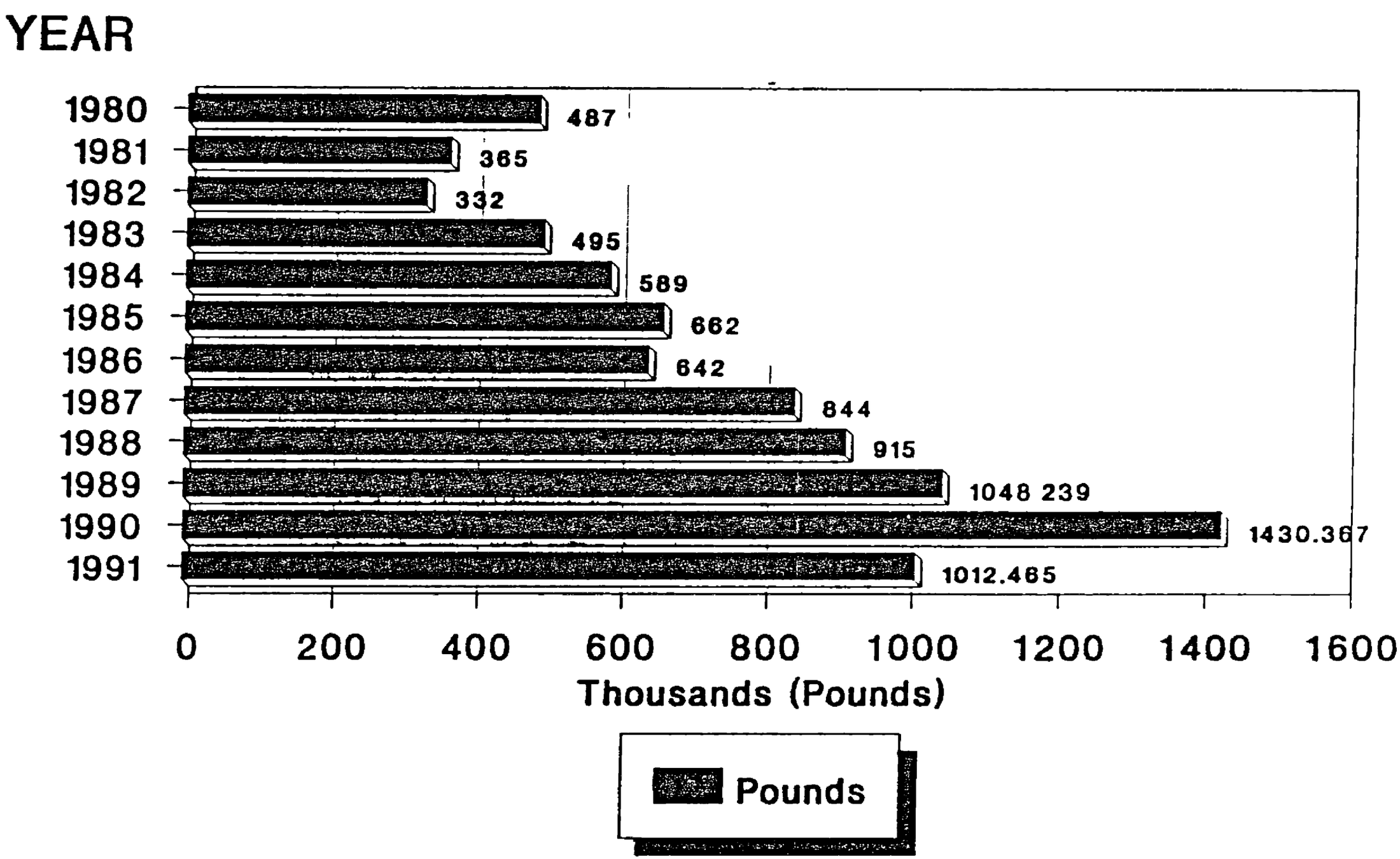
PIG SLAUGHTERED
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 34

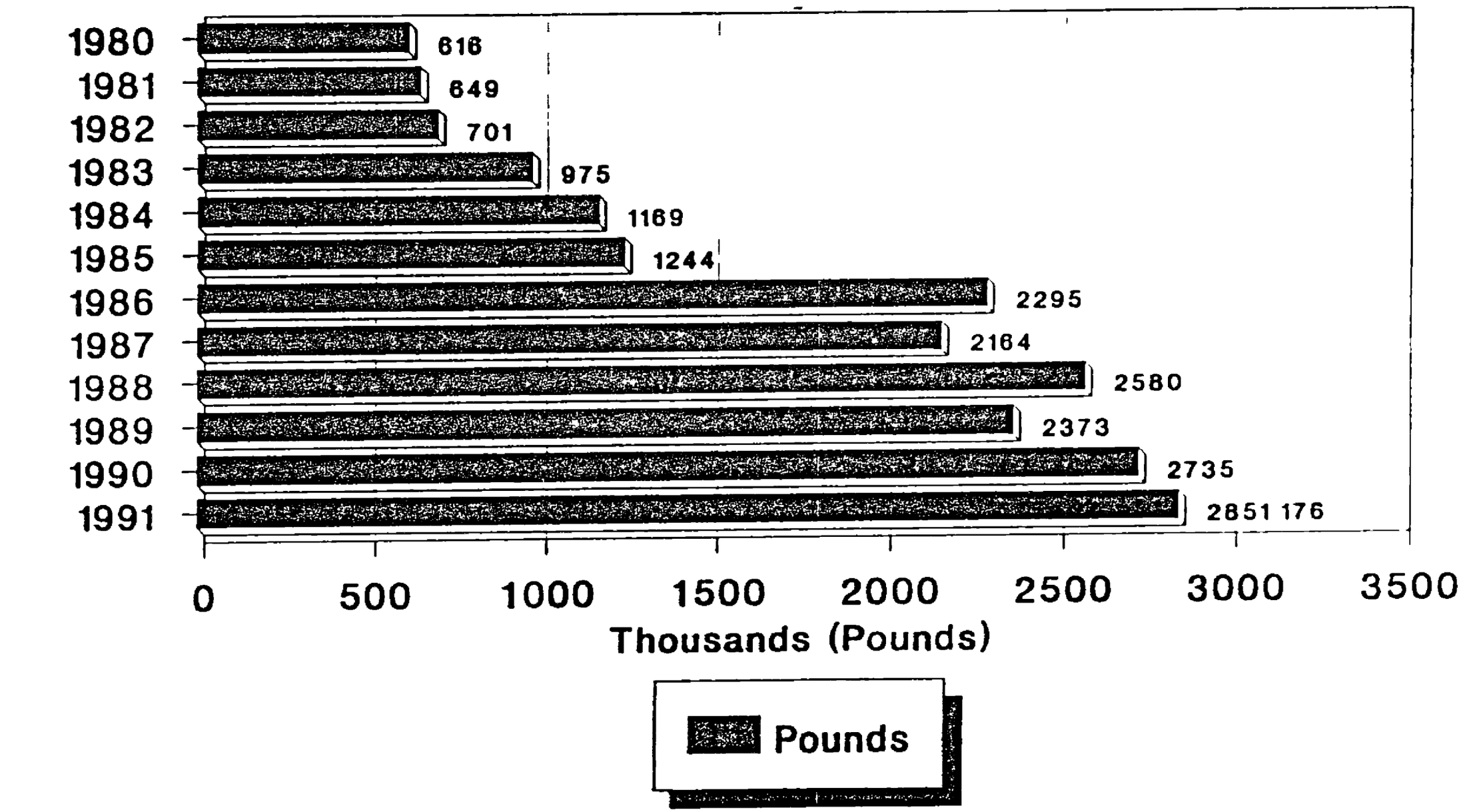
PIG PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 35

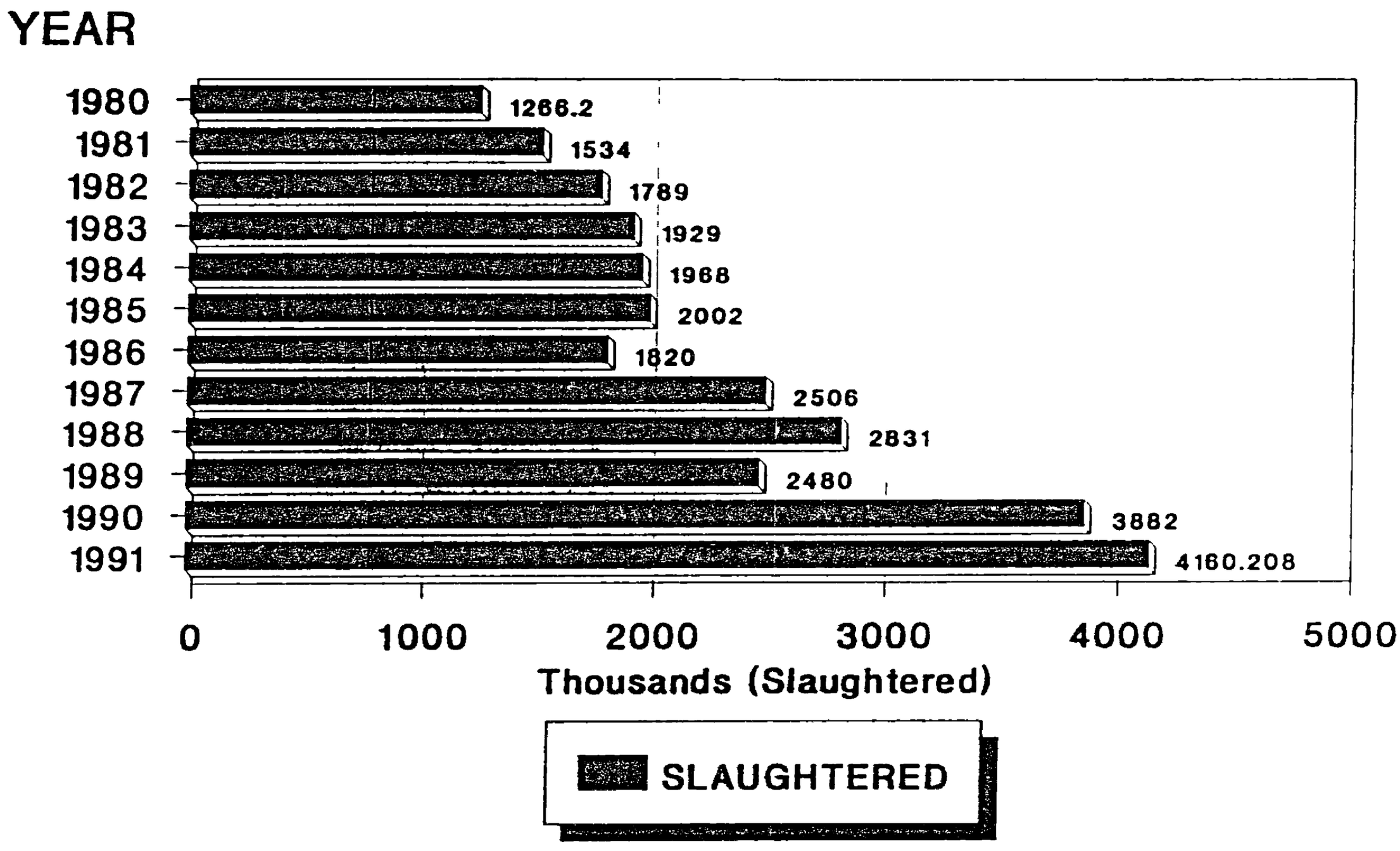
MILK PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 36

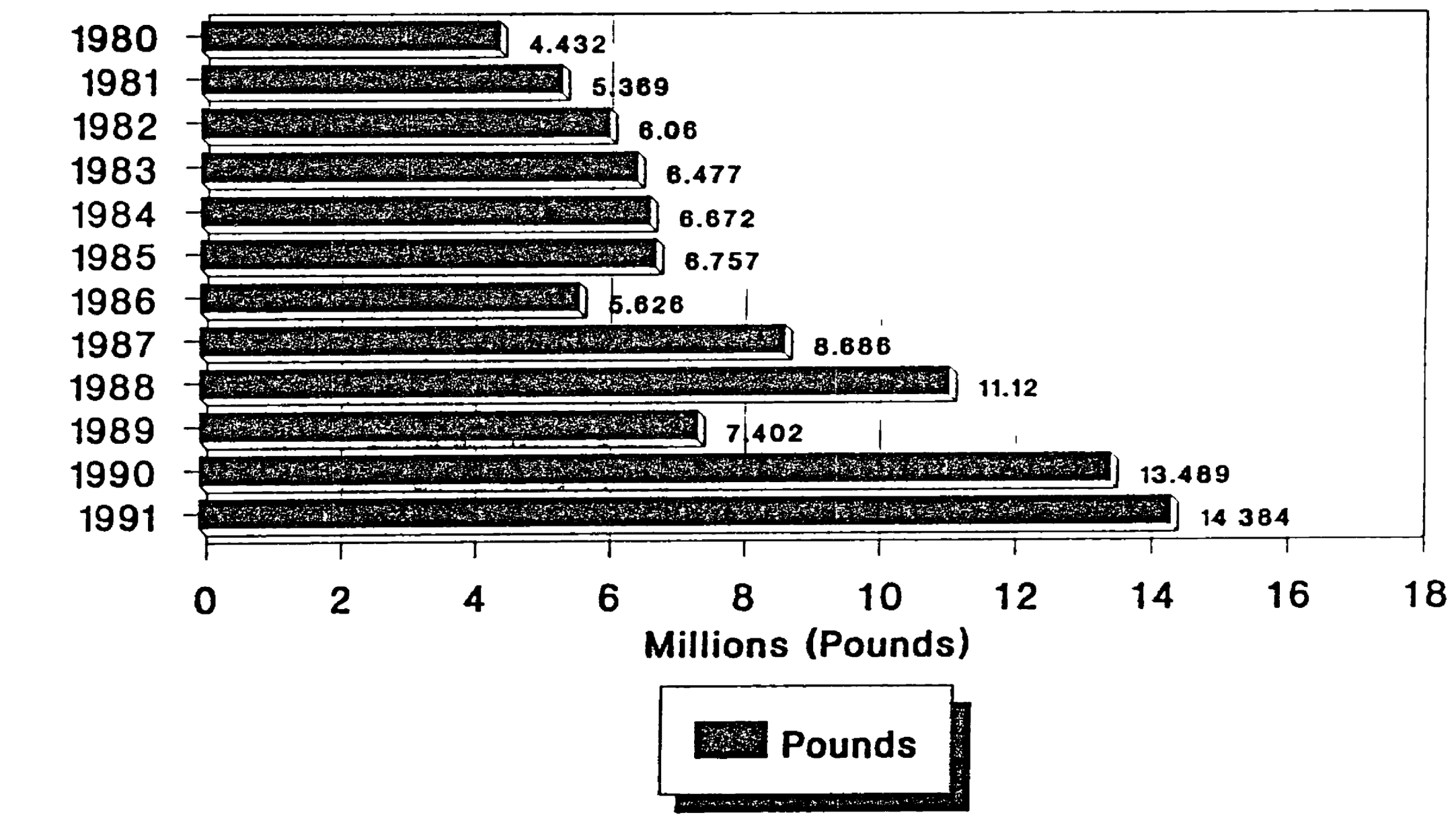
POULTRY SLAUGHTERED
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 37

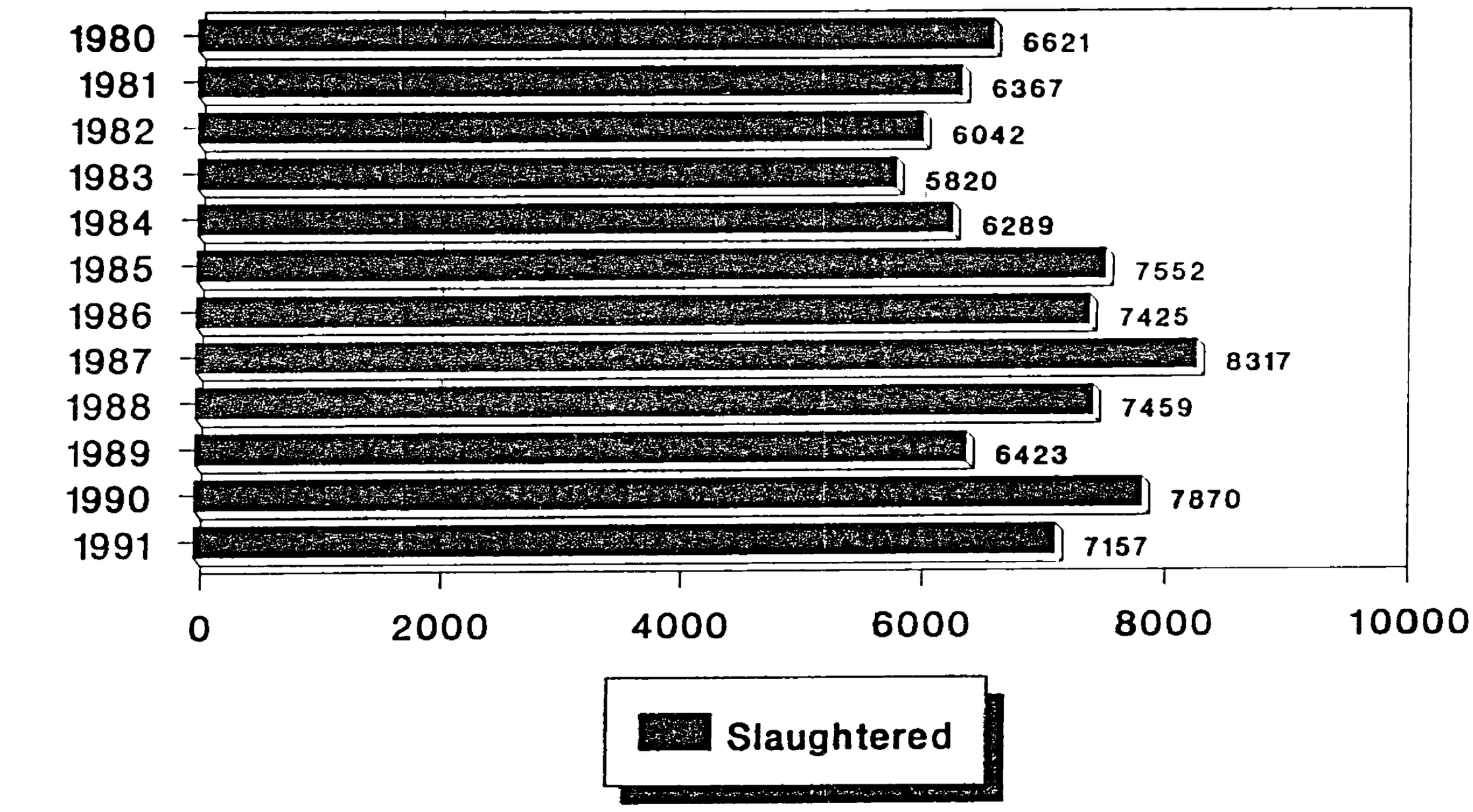
POULTRY PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 38

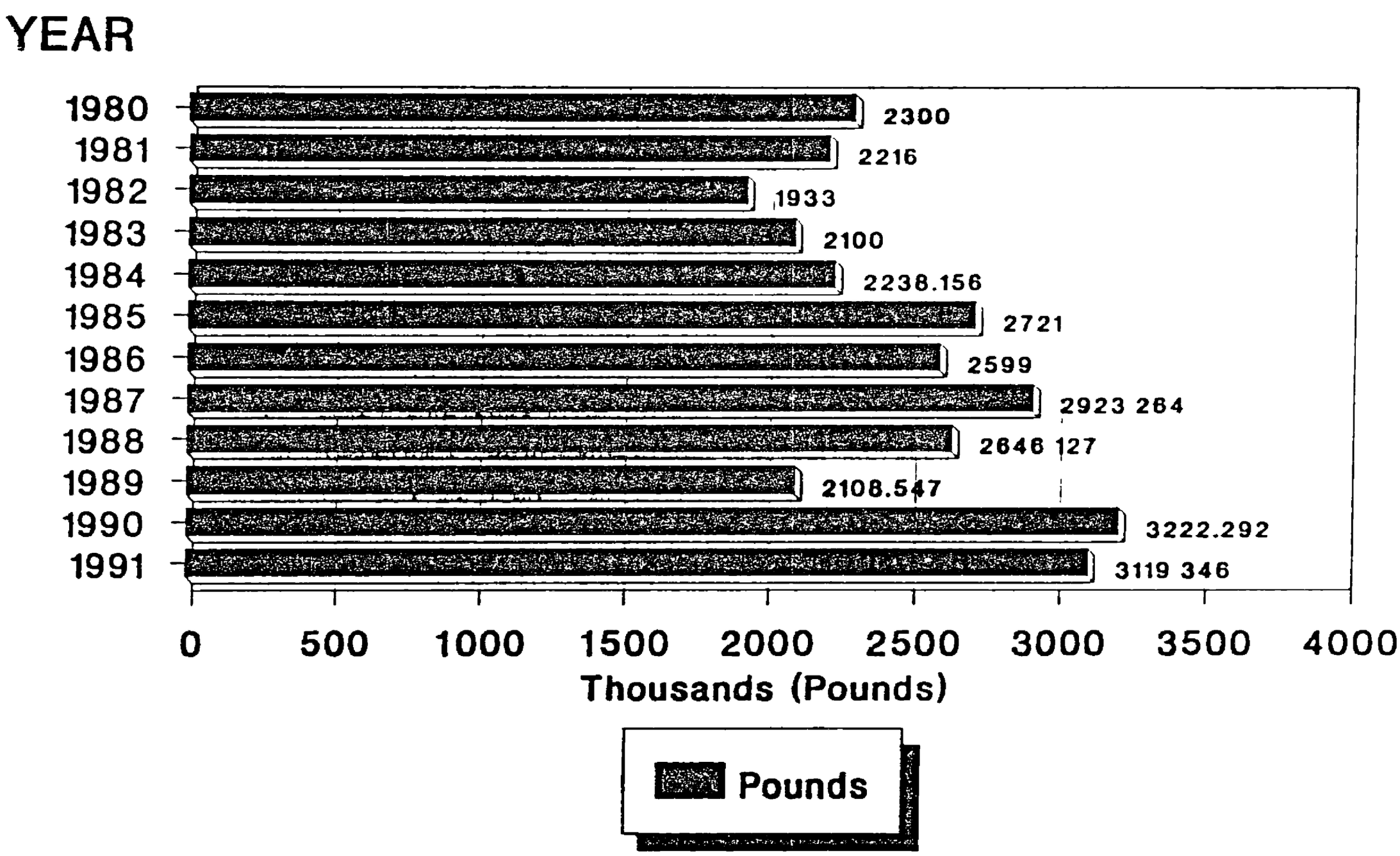
BEEF SLAUGHTERED
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 39

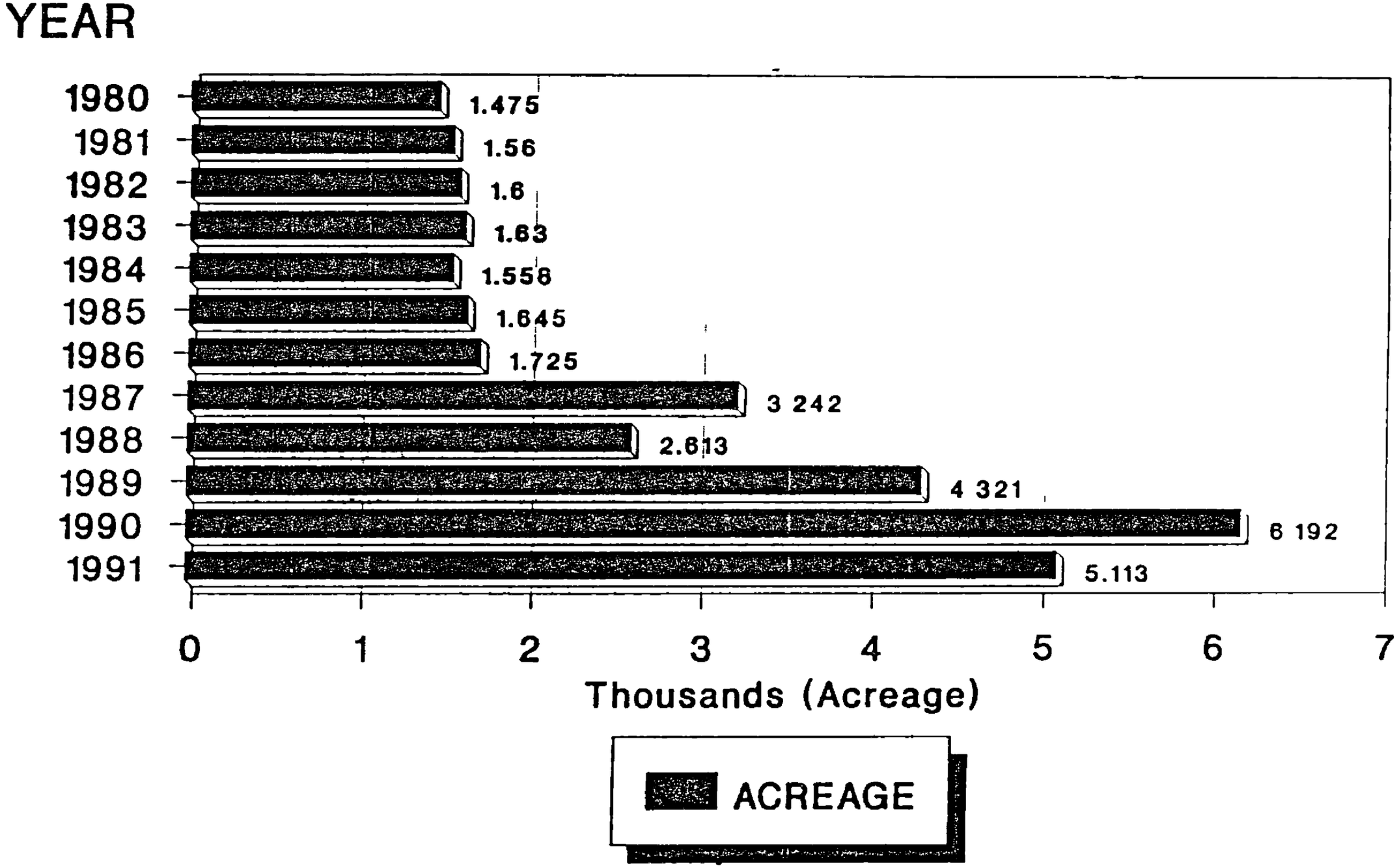
BEEF PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 40

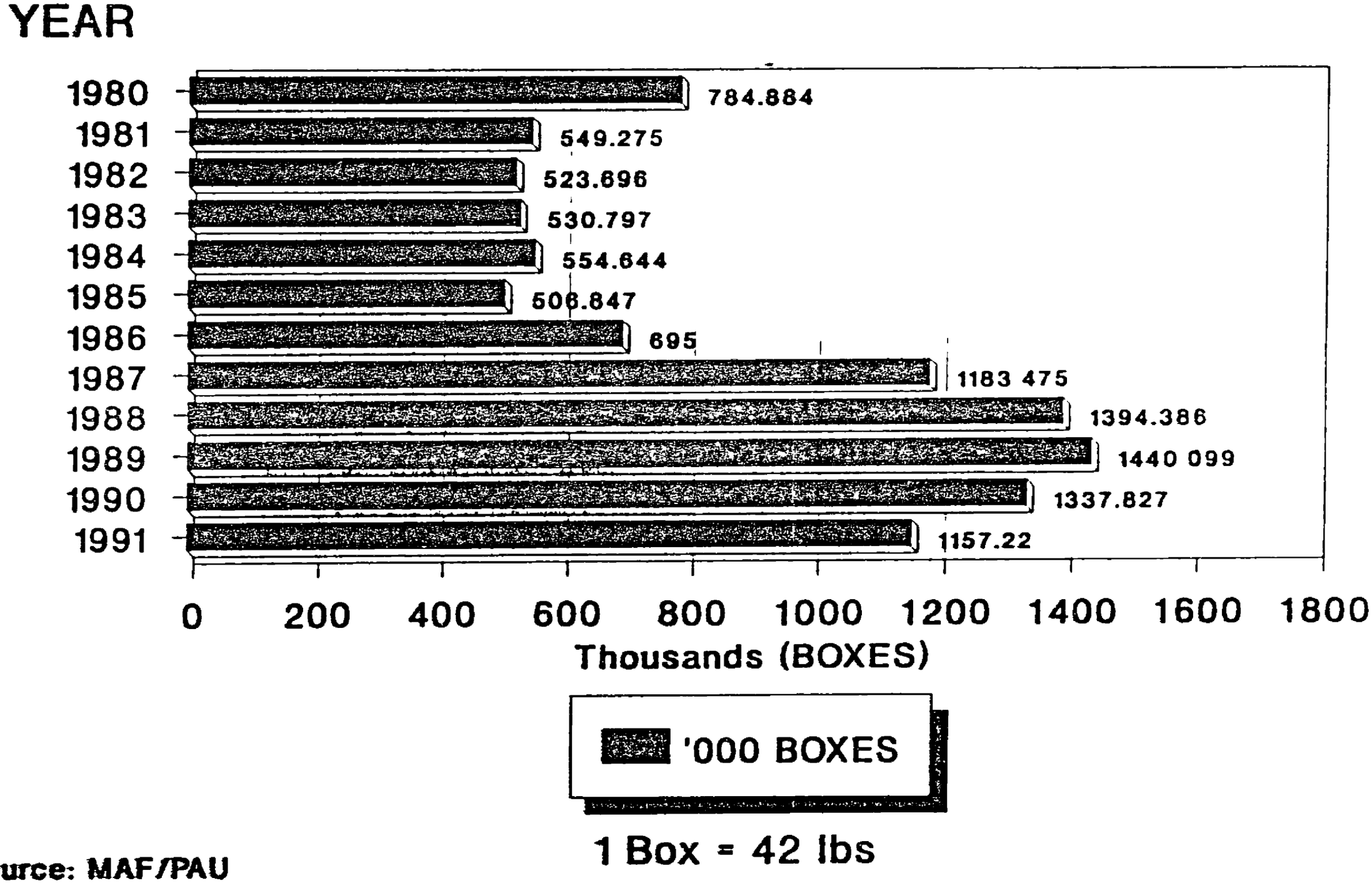
ACREAGES ON BANANAS
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 41

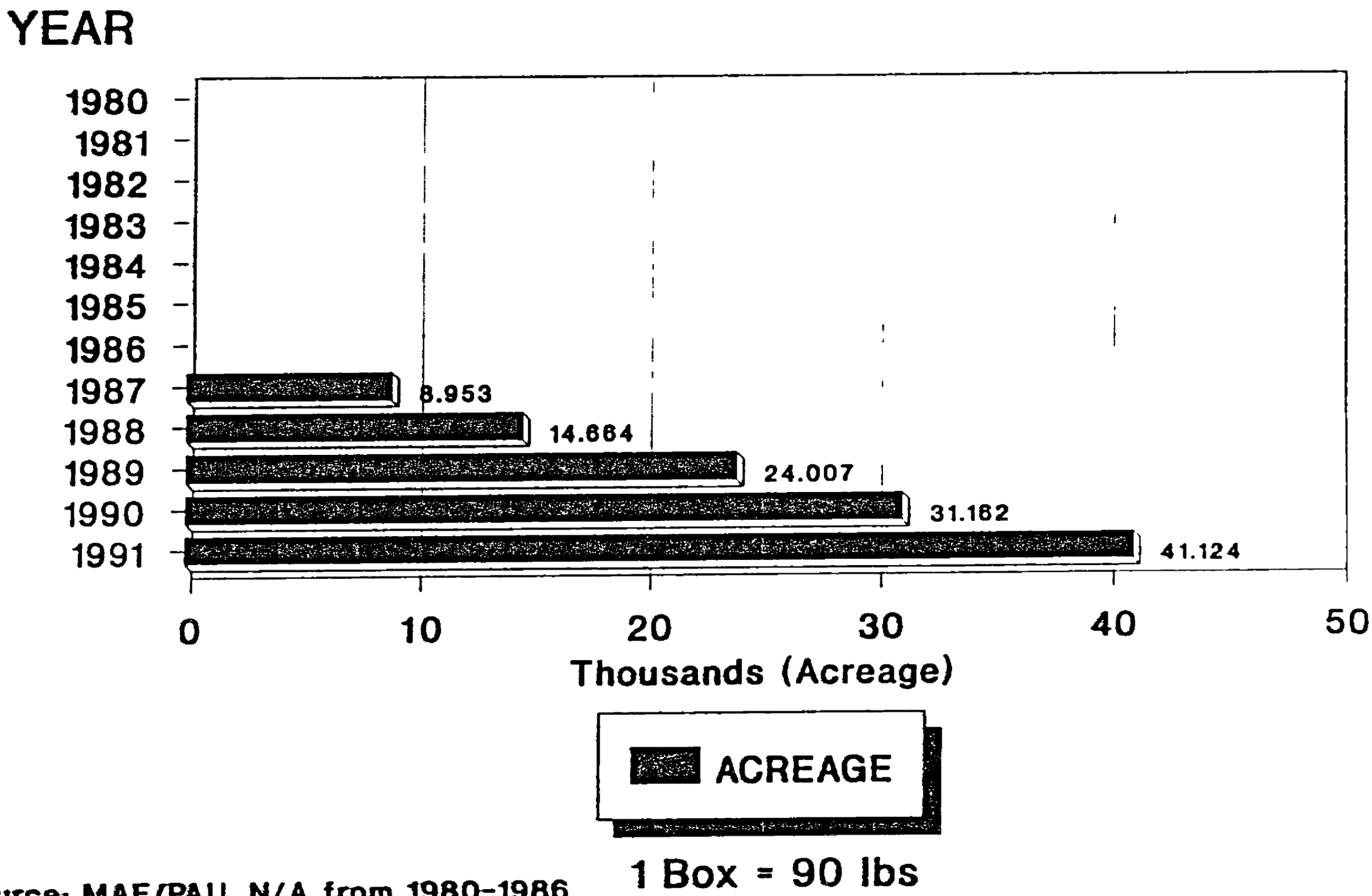
BANANA PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 42

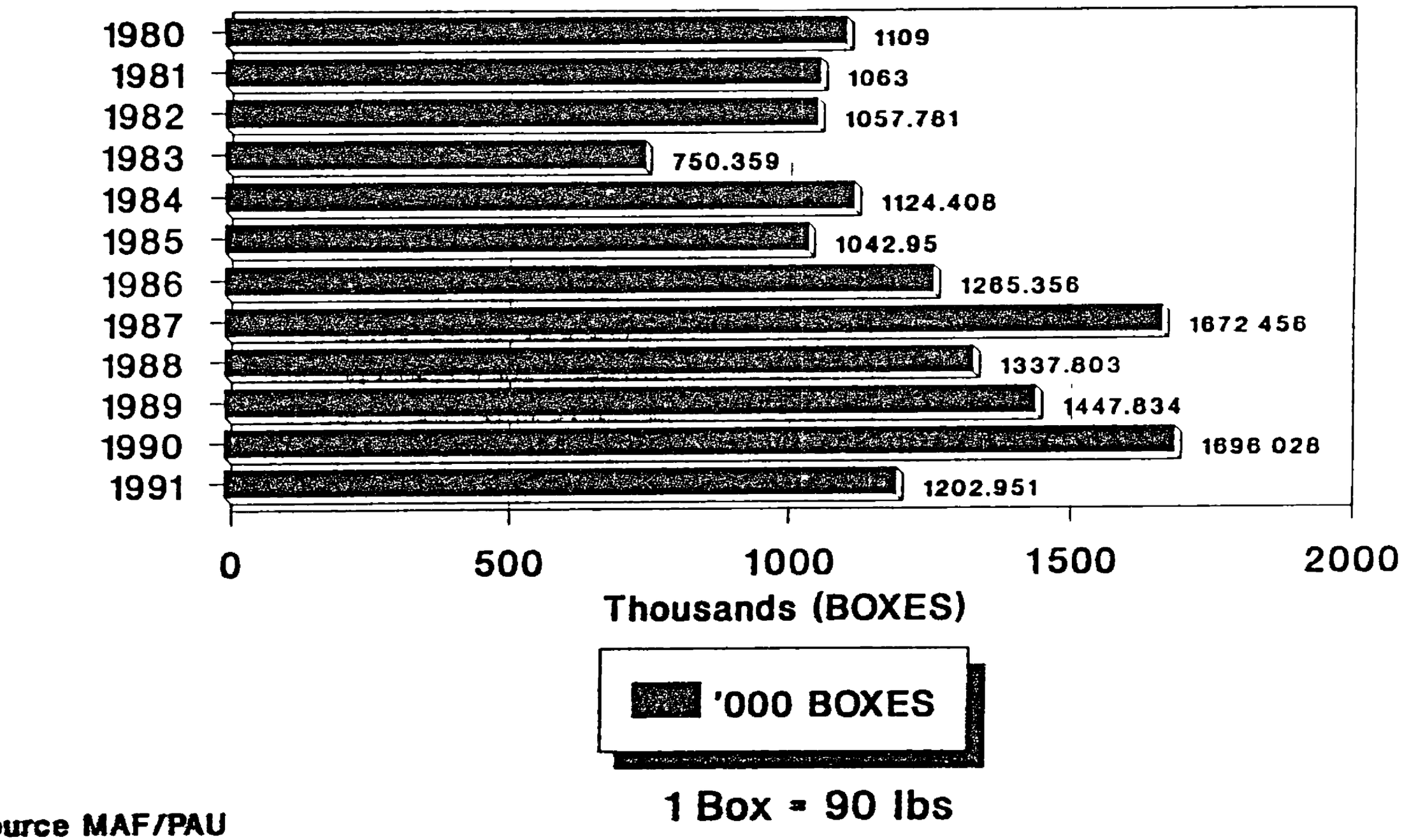
ACREAGES ON ORANGES
Belize 1980 - 1991



Source: MAF/PAU, N/A from 1980-1986

FIGURE 43

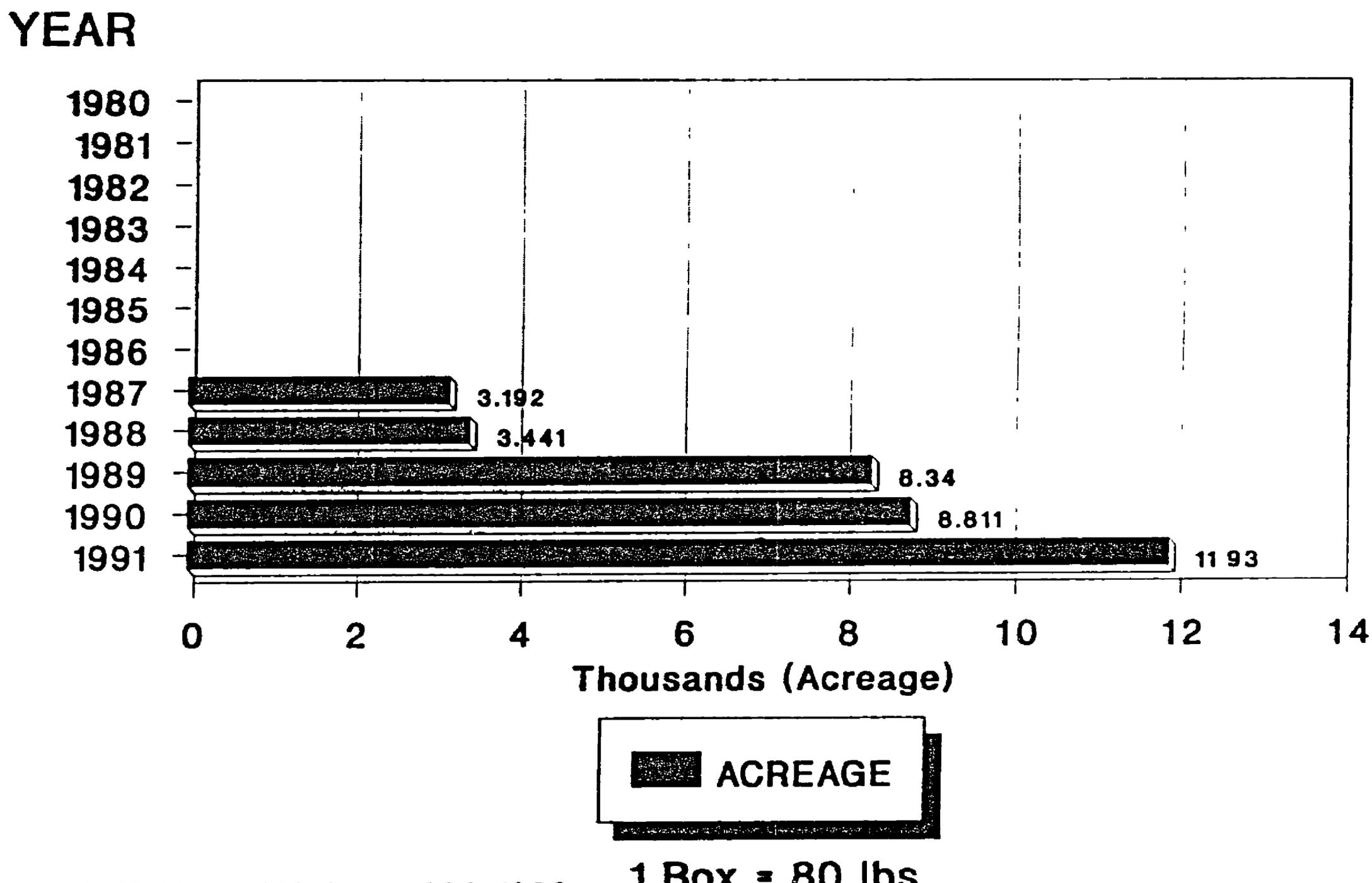
ORANGE PRODUCTION
Belize 1980 - 1991



Source MAF/PAU

FIGURE 44

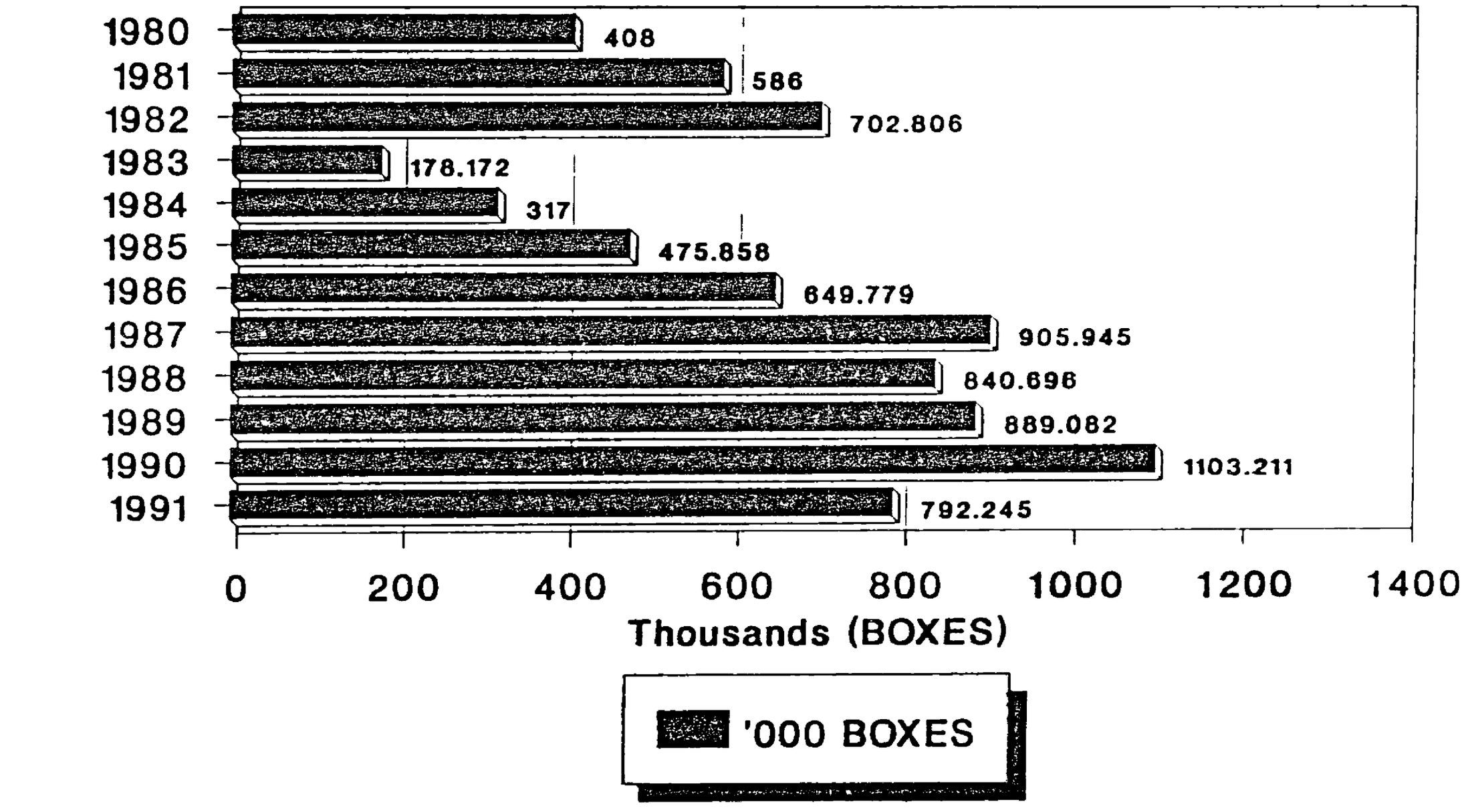
ACREAGES ON GRAPE FRUIT
Belize 1980 - 1991



Source: MAF/PAU, N/A from 1980-1986

FIGURE 45

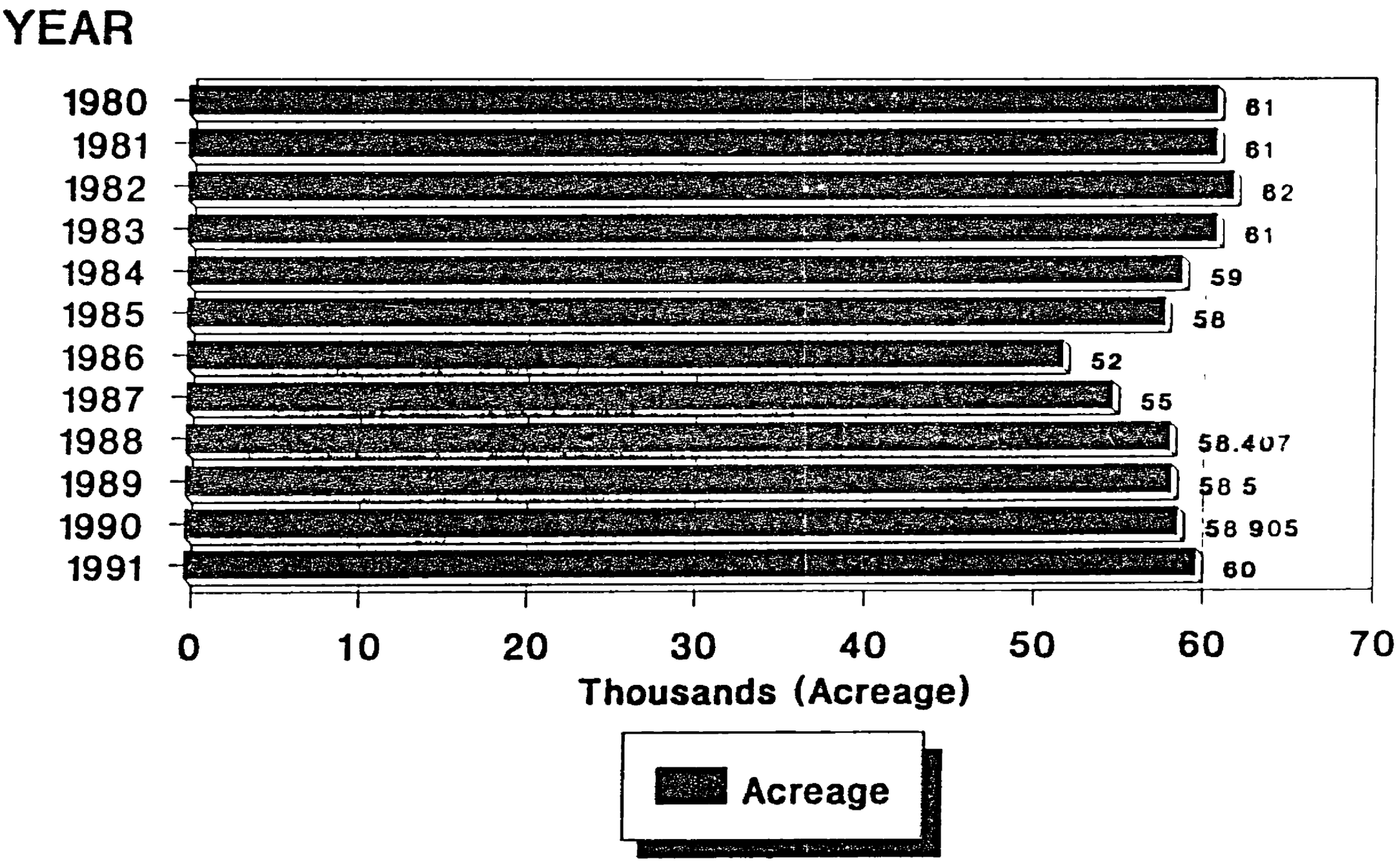
GRAPE FRUIT PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 46

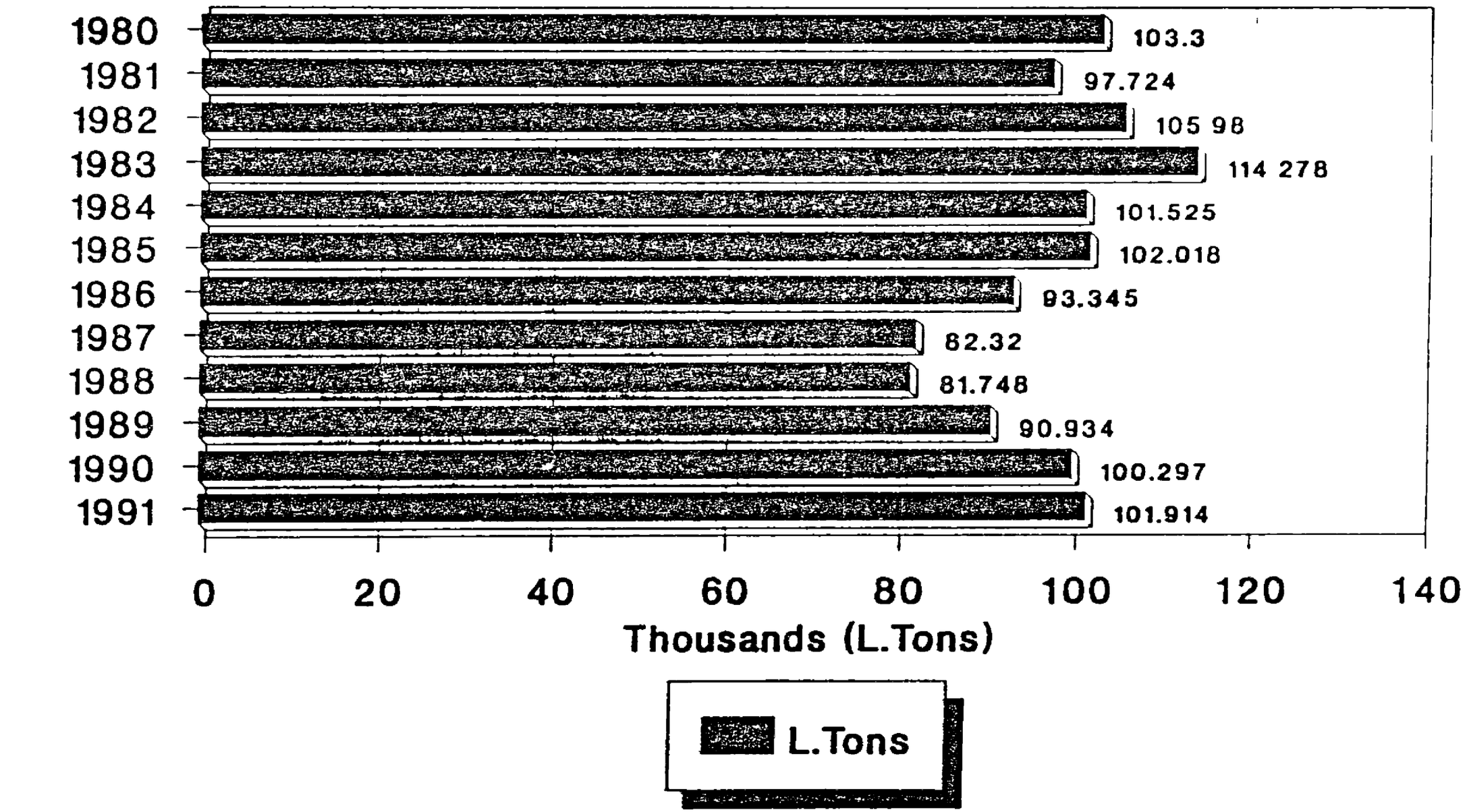
ACREAGES ON SUGAR
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 47

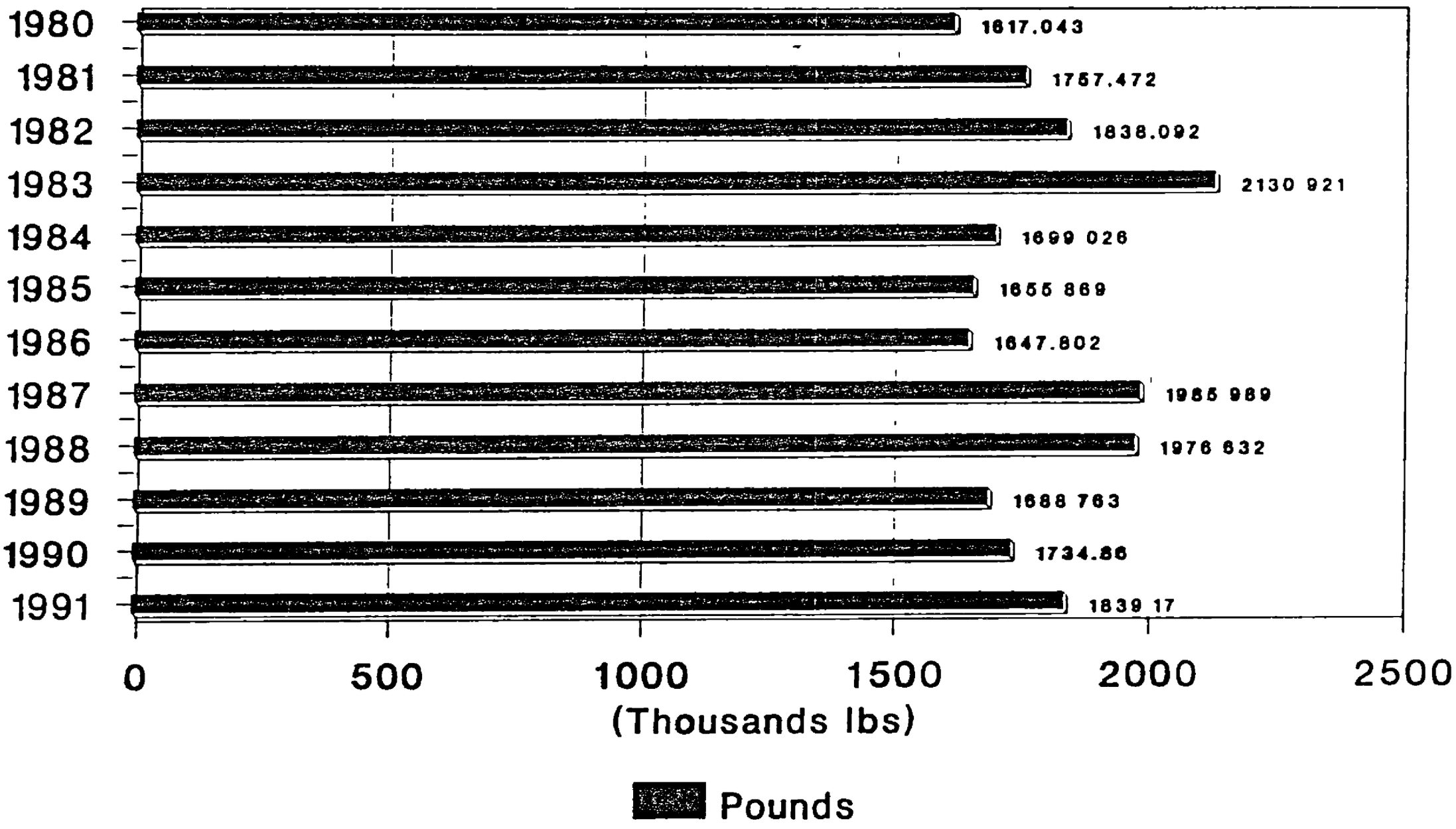
SUGAR PRODUCTION
Belize 1980 - 1991



Source: MAF/PAU

FIGURE 48

FISH PRODUCTS PRODUCTION
Belize 1980 - 1991



Source: PAU/MAF

ANNEXES

ANNEX I

1st Draft
Feb 6th 1992

FOOD AND NUTRITION ASSESSMENT OF BELIZE

PROPOSAL

Dr Rafael Flores, Dr Ninette Reneau and Dr Yma Alfaro

INCAP/PAHO

NUTRITIONAL ASSESSMENT OF BELIZE 1992

INTRODUCTION

The information about the nutritional situation of a population is crucial to Governments because it allows them to know the magnitude and the population groups at higher risk of being affected by nutritional problems, their geographic and sociocultural location

Belize presently lacks up-to-date information on the food and nutritional situation of the population and considering that nutrition is the underlying determinant of health status, and consequently the economic development potential of the population, it is only logical to focus priority attention on this issue

Therefore, the primary purpose of this proposal is to assess the Food and Nutrition situation of the Belizean population by districts, on the basis of existing data as a preliminary phase to further action

It is proposed that this Assessment be done in close coordination with other sectors, especially Education, Agriculture and Social Services as a first step in initiating an intersectoral approach in the long and difficult process of identifying solutions to this multifactorial and complex problem

Problems (1)

- Ten percent of the live births between 1981-1983 were of low birth weight
- Gastro-enteritis, respiratory diseases, malaria, intestinal parasites and tuberculosis are the major communicable diseases which affect the Belizean population.
- Six percent of children under three years of age suffer from moderate to severe malnutrition
- The leading causes of hospitalization of children under five years of age between 1980-1983 were intestinal infectious diseases, bronchitis, emphysema, asthma and diseases of the respiratory tract
- Cardiovascular and related diseases such as heart disease, hypertension, diabetes and obesity are thought to be quite prevalent as evidenced by diseases of the heart, being one of the main causes of death in the country

OBJECTIVES

1 To review and assess the available information on Food and Nutrition situation in Belize

2 To update and describe the principal food and nutritional problems of Belize by district and establish the main causal factors that produce the present situation

3 To propose acceptable and viable options with an intersectoral approach to modify the key causal factors responsible for the present situation

4 To provide information that enables the evaluation and revision of the draft Policy of Food and Nutrition for Belize (2) to serve as a basis for a National Food and Nutrition Plan

5 To strengthen the Belize Food and Nutrition Surveillance System (BFNSS)

METHODOLOGY

A The activities to be carried out to accomplish objectives 1-4 will follow the guideline for nutritional assessment suggested by Beghin, Cap and Dujardin (3) which comprises the following steps

1 Justification and definition of the objectives of the assessment

2 Preliminary appraisal and reconnaisssance

3 Setting up a team

4 Analysis of the causes of malnutrition in the population.

5 Consistency appraisal

6 Assembly of existing data

7 Data analysis and interpretation.

8 Presentation of the results

It is assumed that malnutrition is due to a multiplicity of causes among others low income, illiteracy, an unhealthy environment, unsatisfactory health services, inadequate food habits and low agricultural productivity It is also assumed that solution to the problems requires actions from different sectors, primarily **Health** (MOH), **Agriculture and Fisheries** (MAF) and **Education** (MOE) Thus, when setting up the Belize Nutritional Assessment Team (BNAT) as indicated in step 3, the full participation of three sectors is required

B To achieve objective 5, the initiative for a first Height Census in school-age children in Belize will be supported (please see Annex 1) in coordination with the Ministry of Education The Sentinel Site approach, emphasizing coordination with UNICEF will be promoted

Data Gaps

- Lack of data at the village level that enables the identification of at risk households
- Representativeness of the data collected from the hospitals and clinics of the entire Belizean Population
- The prevalence of parasitism, anaemia, cardiovascular and related diseases is unknown
- The etiology of anaemia is unknown and no data has been collected on whether malaria, whose incidence is increasing, is associated with anaemia

CHRONOGRAM

Step	Responsibles		Due date
	Main	Secondaries	
1	Dr Flores*	Dr Reneau*, Dr Alfaro*, Dr Figueroa■ and Ms Mackenzie■	Feb 7
2	Dr Alfaro	Dr Reneau, Dr Sinha♦, Dr Figueroa and Ms Mackenzie	Feb 14
3	Dr Reneau	MOH, MOA, MOE, Dr Alfaro	Feb 21
4	Dr Figueroa	Dr Reneau, Dr Alfaro, Dr Sinha, Ms. Mackenzie, Dr. Flores + BNAT	Mar. 6
Visit from INCAP-CFNI-ROCAP to Belizean Authorities			
	Dr Delgado*	Dr Patterson♦	
5	Dr Alfaro	Dr. Reneau + BNAT	Mar 11
6	Dr Alfaro	Dr Reneau + BNAT	Apr 24
7	Dr Reneau	Dr Alfaro + BNAT + CFNI + INCAP teams	May 15
8	Dr Figueroa	Dr Reneau, Dr Alfaro + BNAT + CFNI + INCAP teams	May 29

* INCAP/PAHO
■ Ministry of Health (MOH)
♦ CFNI/PAHO

REFERENCES

1 Farnum, Sandra Up-date of Food and Nutrition Statistics 1979-1984 Belize, PAHO/Belize, 1984, 98 p

2 Leslie, Kenneth Report on the Workshop to Evaluate and Revise the 1979 Food and Nutrition Policy for Belize Jamaica, Caribbean Food and Nutrition Institute (CFNI)/Pan American Health Organization (PAHO), 1982, 25 p

3 Beghin, Ivan, Miriam Cap and Bruno Dujardin A Guide to Nutritional Assessment Geneva, World Health Organization, 1988, 80 p

ANNEX II

STEP 2
PRELIMINARY APPRAISAL
AND RECONNAISANCE

A swift review of the available information on food, nutrition and health revealed that several attempts have been made in the past fifteen years to conduct assessments of the situation. In 1976 the Caribbean Food and Nutrition Institute (PAHO/WHO) with the help of the officials from various sectors of the Government of Belize (e g Health, Agriculture, Central Planning, Marketing Board, Customs House, etc) carried out an exercise which resulted in an extensive report "AN ASSESSMENT OF THE FOOD AND NUTRITION SITUATION IN BELIZE" This was followed in 1977 by an analysis to the food and nutrition problem in Belize These two documents formed the basis for the development of the "FOOD AND NUTRITION POLICY FOR BELIZE" This was followed by a study on the development of suggested programmes and projects with particular reference to the agriculture sector

An extensive data base exists in Belize on various aspects on food, nutrition and health including health and disease situation, food availability, and household expenditure which are collected at periodic intervals The data from various sources up until 1984 are analysed by Farnum and provides an excellent review of the various factors affecting the food and nutrition situation in Belize It also points to the data gaps and recommendations for action (Appendix 1)

Belize, like many countries of the Caribbean, is in an epidemiologic transition. As the economic situation has been gradually improving, so have the trends for health and disease Life expectancy has greatly increased In general, many of the maternal and child health and environmental problems have been improved Infant mortality has gradually declined to very low levels and continues to decline Malnutrition in children from 0 to 4 years still persists in some areas of the country This problem is perceived as being attributed to the influx of sizable refugee population. Nutrition related chronic non-communicable diseases such as diabetes, hypertension, heart disease and some of the cancers are quickly becoming major health problems.

Food availability has greatly improved Total daily per capita caloric availability has increased from 2,349 in 1961-63 to 2,628 in 1986-88 (Table 1) It is interesting to note that in spite of the vast potential for growing food crops, the contribution of energy from complex carbohydrates has declined Most of the increase in caloric availability has been from simple sugar, and food from animals and fats and oils (Table 2) Thus the total fat availability per person per day during this period has increased from 56 to 73 grams compared to the recommended 42 grams Seventy percent of the fat is derived from animal sources, thus increasing the consumption of saturated fat

This is further supported by the eating pattern of the Belizean people, as analyzed by Farnum There is very little information available on food distribution within the family Given the changing pattern of nutritional and nutrition related health and disease patterns, such changes in food availability need to be guarded against In the present Food and Nutrition Assessment endeavour, these aspects need to be given due consideration

A greater degree of understanding of food and nutrition exists among the technical personnel However, a greater effort will be needed to create an understanding among the general population to bring about changes in eating behavior to avert the onslaught of chronic disease, which has already assumed epidemic proportions.

A preliminary review of the information and interviews with knowledgeable persons in various sectors indicate that more up-to-date data has become available between 1984 and 1991 An in-depth examination of this data would give a more up-to-date information for the development of policy, programmes and projects for the improvement of the nutrition and health situation of the people of Belize

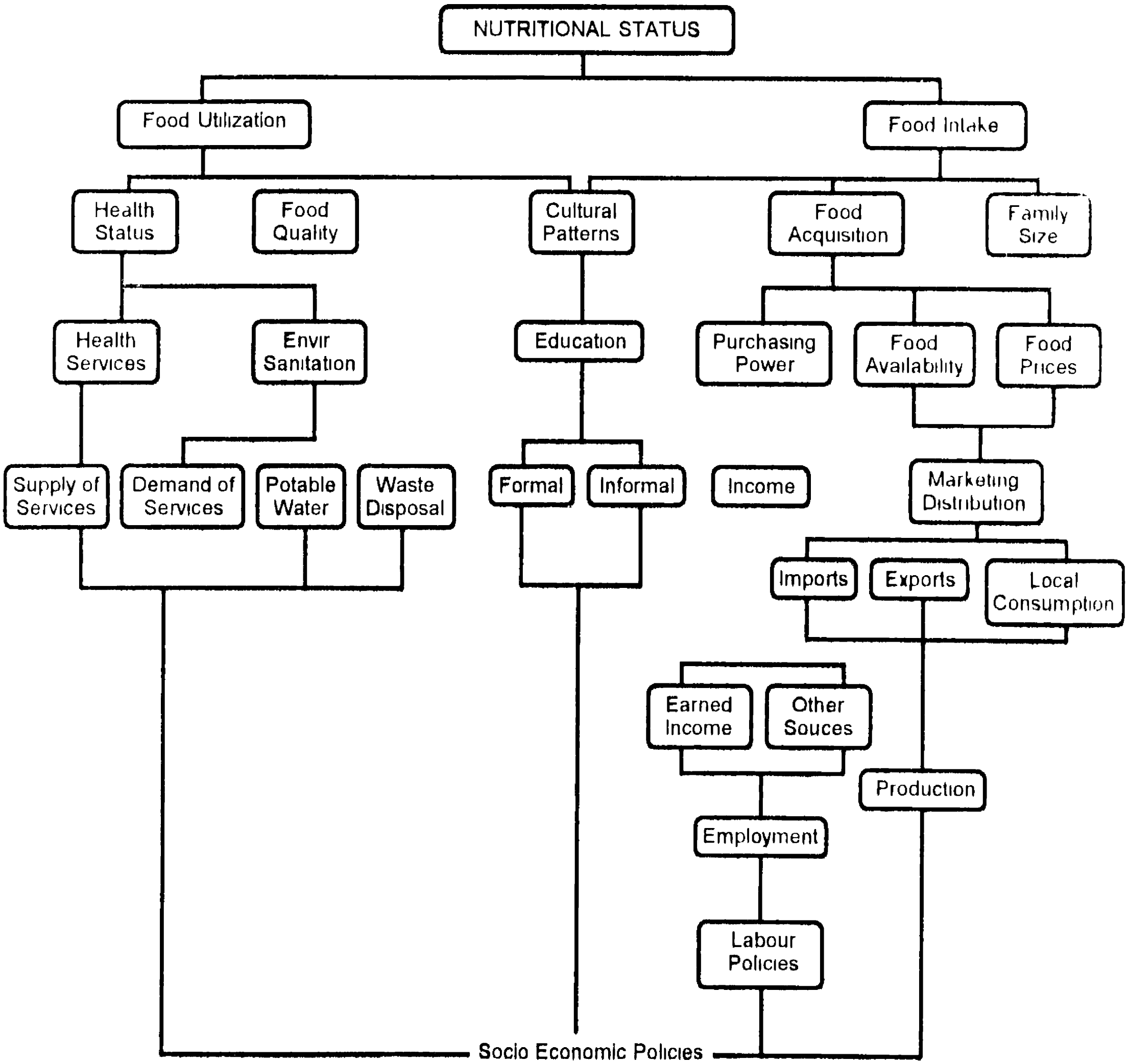
ANNEX 3

BELIZE NATIONAL FOOD AND NUTRITION ASSESSMENT
TEAM COMPOSITION
1992

Sector	Nane of Person	Post
Ministry of Health	Dr Ramon Figueroa	Director Maternal and Child Health Programme
	Ms Gilda Dennison	Nutrition Officer
	Ms Dorla McKenzie	Public Health Nurse
Ministry of Education	Mrs Maria Magaña	National Coordinator, Drug Prevention Programme
Ministry of Agriculture	Mr Wendell Parham	Policy Analyst
Ministry of Social Development	Ms Anita Zetina	Ag Director, Department of Women's Affairs
Central Statistical Office	Mr David Garcia	Statistician
	Mr Martin Aldana	Statistician
INCAP/PAHO	Dr Ninette Reneau	Nutrition Consultant
	Dr Yma Alfaro	Nutrition Consultant
UWI - School of Continuing Studies	Mr Dudley Augustine	Training Coordinator for the Community Development Training Programme

ANNEX 4

3RD AND FINAL VERSION OF CAULSAL MODEL FOR THE BELIZE NUTRITIONAL ASSESSMENT



BELIZE NATIONAL FOOD AND
NUTRITIONAL TEAM
MARCH 25/92