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Liberia

## A. General

Although Liberia's livestock population is small and normal requirements for veterinary services are therefore of relatively minor magnitude, the country has only one veterinarian and a small staff of trained assistants. Several veterinary advisory technicians from international organizations have, over the past ten years, recommended the recruitment and training of veterinary and technical personnel.

Serious widespread animal diseases and parasitism have long been recognized as the inhibiting factors in the development of a successful livestock industry. Many of these conditions are also recognized as serious public health problems. Despite the awareness of these problems and repeated recommendations by technical assistance veterinarians, the government has done little to promote animal disease preventive measures. Apathetic response to serious animal disease conditions not only creates disease epizootics and contributes to nutritional deficiencies, but also imposes a heavy economic burden for payment of animals or animal products on a country that is potentially capable of adequately supplying its animal protein requirement. 1/5/6/8/17/

## B. Environmental factors affecting health

1. Topography and climate -- Each of the three major topographic zones, the flat coastal strip, the rolling hilly middle strip and the mountain areas of the interior, contain considerable land adaptable to livestock raising. However, all of these zones fail to support significant numbers of animals because of mismanagement,

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tsetse fly and other parasitic infestation, or failure to stock areas with adaptable types of animals. The climate, though not severe, is as enervating for most classes of livestock as it is for humans. 5/ 6/ 8/ 16/ 17/

2. Socio-economic pattern -- Because of tsetse fly infestation and consequent trypanosomiasis infection among humans and cattle, large areas of the country are not habitable. In any case, the livestock population of Liberia is almost insignificant, the people having little pastoral tradition. The few herds and flocks that do exist are principally in the hands of local chieftains or the rubber plantation concessioners. The latter have attempted to maintain herds to supply their workers with products for a balanced diet. 5/ 6/ 8/ 17/ 23/

## 3. Animal and plant life

## a. Animal

(1) Mosquitoes -- Liberia's swamps, ample rainfall and uniformly warm climate provide excellent breeding grounds for mosquitoes. Repeated attempts to control mosquitoes, chiefly in the area of Monrovia (6-19N - 10-18W), have ended in failure. The ubiquitous mosquito continues unchecked, and the major share of the population at some periods of life contracts malaria. Anophelene mosquitoes occur in great numbers, particularly along the coast. Anopheles gambiae, A. melas and A. funestus are the most common malaria vectors. A. nili, A. hargreavesi, A. marshallii and A. pharoensis, are also vector the disease. A. smithii, A. muritainus, A. cinctus, A. obscurus, and A. hancocki are also reported. Filariasis in man is transmitted by A. gambiae, A. funestus and A. nili.

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Aedes mosquitoes, which are capable vectors of yellow fever and dengue, are common. However, no yellow fever has been reported in Liberia for many years, but dengue may occur. Reported Aedes species are A. aegypti, A. africanus, A. apicorgenteus, A. tarsalis, A. fuscinervis and A. palpalis.

Culex mosquitoes, possible vectors of yellow fever or filariasis, identified are C. pipiens quinquefasciatus (fatigans). Others are C. nebulosus, C. decens, and C. consinilis.

Eretmapodite chrysogaster and Taeniorhynchus uniformis, both capable of carrying yellow fever, have been reported in Liberia. 4/ 6/ 13/ 17/ 18/ 22/

(2) Flies -- Innumerable species of flies are found abundantly in Liberia.

The more important ones are listed below, with the diseases they cause in different species of animals.

<u>Musca domestica</u>	Mechanical transmission of enteric diseases in man.
<u>Glossina palpalis</u> - sleeping sickness in man )	) Nagana in cattle
<u>G. fusca</u> , Walker )	
<u>G. pallicera</u> , Bigot )	
<u>G. nigrofusca</u> , Newstead )	
<u>G. medicorum</u> , Auston )	
<u>Stomoxys spp.</u>	Nuisances. Mechanical vectoring of food poisoning organisms.
<u>Tabanus spp.</u>	Possible trypanosome vectors to animals. Painful bites. Loiasis.
<u>Haematopota spp.</u>	Possible trypanosome vector to animals. Painful bites.
<u>Cordylobia anthropophaga</u> (Tumba flies)	Cutaneous myiasis
<u>Simulium damnosum</u>	Onchocerciasis
<u>Phlebotomus spp.</u>	Cutaneous leishmaniasis
<u>Culicoides grahami</u>	Filariasis
<u>C. austeni</u>	Filariasis

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(3) Lice -- Pediculus humanus is present and may result in sporadic cases of louse-borne typhus. Haematopinus suis occurs in swine. 6/ 8/

(4) Fleas -- Ctenocephalides canis is common. One species of Xenopsylla has been identified, but it occurs more rarely. 6/ 8/ 9/

(5) Ticks and mites -- Ticks are the most common external parasites in Liberia. Ticks identified are listed below.

Boophilus decoloratus

Amblyomma variegatum

A. splendidum

Rhipicephalus spp., including R. sanguineus.

Hyalomma spp.

Ornithodoros erraticus

Argus persicus

Ixodes pilosus

I. rarus

Identified mites include Sarcoptes scabiei and Demodex folliculorum. 6/ 8/ 9/ 18/ 19/

(6) Other arachnids and insect pests -- Stinging ants are a serious nuisance and have been reported to have caused deaths in swine. 6/ 8/

(7) Mollusks -- Physopsis africanus and Planorbis pfeifferi and several other species of snails found in the interior harbor Schistosoma hematobium and S. mansoni. 6/ 8/ 9/ 19/

(8) Worms -- A great variety of parasitic worms exist in Liberia. The most common identified species are listed below.

Ascaris lumbricoides

A. vitulorum

Strongyloides stercoralis

Necator americanus

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Dracunculus medinensisHaemonchus contortusOesophagostomum spp.Wuchereria bancroftiLoa loaSchistosoma hematobiumS. mansoniTaenia saginataEchinococcus granulosus

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(9) Reptiles -- Several species of snakes are identified in Liberia,

including the non-poisonous pythons, Python sebac and Calibaria reinhardtii.

Poisonous snakes include cobras, vipers and mambas listed below.

<u>Scientific name</u>	<u>Common name</u>
<u>Naja melanolenca</u>	black cobra
<u>N. goldii</u>	arboreal cobra
<u>Dendrapis viridis</u>	green mamba
<u>Causus rhombeatus</u>	Gape viper
<u>Bitis gabonica</u>	Gaboon viper

6/

(10) Rodents -- Mus (Rattus) alexandrinus, the roof rat, Mus (Rattus)rattus, the black rat, Mus norvegicus, Norwegian or wharf rat, and several other

species have been identified. 6/ 9/

(11) Wild animals -- The wildlife fauna has been far less surveyed than

in many other West African countries. Several wild animal species, including

monkeys, may be involved as reservoirs of disease. Wild dogs and other wild

carnivora as well as uncontrolled domestic canines are probably significant factors

in the perpetuation of rabies. 6/ 8/ 9/ 19/

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## 4. Nutrition

a. Dietary level -- Except for occasional bad years, the agricultural crops of Liberia provide enough calories for a reasonable subsistence diet in a tropical area. The caloric intake has been estimated at about 2500 per capita. However, serious malnutrition in both tribal and urban Liberians does exist as a result of animal protein deficiency. Tribal food customs are so varied and estimates of production of particular types of food so irregular, that it is impossible to calculate the percentage caloric intake from specified food items. By far the greatest calorie supply is from rice and cassava. Vegetable oils account for about one-seventh of the calories consumed. Calories from animal fats or meats are negligible. Although all kinds of rodents, reptiles and insects are avidly eaten by the tribal people, this protein source is too small and uncertain to make up much of the protein deficiency. Virtually all classes of livestock, few in number, are small and ill-fed and contribute very little to the diet. A few head of livestock are imported to supply a part of the urban requirements.

Important food stocks are lost through the depredation of rice-birds and insects.

Tribal cooking or food preparation habits are similarly crude as in other primitive societies, but the local people are inured to the effects of such customs and suffer less serious consequences than would be expected in a more sophisticated population. The use of vitamins or other food elements as supplements is practically non-existent. 1/ 5/ 6/ 14/ 15/ 17/

b. Food supply and distribution -- Age old customs of household storage of non-perishable food products still pertains. Rice and the small amount of other hard

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grains produced are harvested and stored beneath the thatched roofs of native houses. Small surpluses are traded in the Lebanese shops for clothing or other requirements. Cassava and vegetable crops are consumed as they are harvested. The few small and poorly fed native pigs or chickens are generally consumed locally, but a few find their way to villages as trade items.

The few cattle produced within the country and those moved in from surrounding countries are generally moved by foot to Monrovia for slaughter. The foreign companies operating rubber or mining concessions are required to provide foodstuffs, including such items as meat and eggs, for employees.

Most of the food supplies for Monrovia, other than the insufficient local production, are met by importation. The principal items imported include grains, sugar, vegetables, meat and eggs. Considerable loss through spoilage arises because of inadequate dock and storage facilities, as well as lack of local transportation.

In late years, serious efforts have been made to expand the poultry industry, but diseases, marketing restrictions and lack of indigenous feed grain supplies have limited this development of cattle herds. 1/ 5/ 6/ 8/ 17/

c. Food sanitation, storage and technology -- Aside from limited facilities in Monrovia and at the foreign commercial firm operations, storage facilities are primitive and individual household units subject to the onslaught of insects and rodents. Cold storage facilities have been expanded in recent years in Monrovia but these are still inadequate for requirements in handling perishable food products. Little sanitary precaution is exercised in handling food and, as a result, enteric disturbances of various nature are common. 1/ 6/ 8/

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## C. Diseases

1. Diseases of man -- Although Liberia claims that more money is spent here on health services in proportion to national income and population than anywhere else in the world except Sweden, health conditions are far from ideal. Foreign concerns operating in Liberia are required to provide health services for employees, and in these areas preventive medicine is quite efficient, and generally adequate hospital and dispensary facilities are maintained. The "zo" or native witch doctor, dispenser of "bush medicine," wields considerable influence in tribal life but certainly adds little and more probably adversely influences disease control.

## a. Diseases prevalent among the population

(1) Malaria -- Malaria is undoubtedly the most serious disease problem in Liberia. It has been reported that every Liberian at some time of life is affected by the disease, and well over half of the population harbors the parasite in the blood stream at any one time. Plasmodium falciparum is the predominant parasite but Plasmodium malariae is by no means uncommon. P. ovale is rare and P. vivax is said not to exist. In 1957 the total number of cases treated at government clinics was 38,784. Control programs around Monrovia began in 1947, and extended along the coastal strip later. The Firestone Plantation has carried out control measures in the areas of its plantations. Anopheles gambiae, the principal vector, has periodically developed resistance to insecticides and malaria incidence during the resurgence of the vector rises. Malaria control has been largely supervised by United States aid agencies.

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(2) Smallpox -- Smallpox occurs periodically and at times, as for example in 1958-1959, it reaches endemic proportion. Few of the tribal people are vaccinated. The disease, often severe, has not generally resulted in high mortality.

(3) Trypanosomiasis -- Sleeping sickness is not uncommon and two hospitals are maintained to treat victims. In addition to Liberian patients, a number of affected people from surrounding countries seek treatment at these hospitals. The tsetse fly, vector of the disease, renders some areas uninhabitable.

(4) Tuberculosis -- Although no extensive tuberculosis surveys have been conducted, the incidence of this disease is probably high. The low nutritional level, unsanitary living conditions, and crowding contribute to infection and complicate its course.

(5) Yaws -- Before 1956 yaws was very common, but from 1955 to 1957 an intensive nationwide program involving treatment of over 490,000 persons reduced the incidence enormously. Yaws is still seen in Liberia but far less commonly.

(6) Diarrheas and dysenteries -- Undefined gastro-enteric diseases are common among the natives, and visitors to the country are frequently affected also. Bacterial infections are probably the most frequent cause but amebiasis is not uncommon. The part viruses may play in enteric infections has not been investigated.

(7) Ancylostomiasis -- Hookworm is common since a high proportion of the natives do not wear shoes and promiscuous defecation contaminates the soil.

Necator americanus is the prevailing parasite in Liberia as it is throughout West Africa.

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(8) Schistosomiasis -- Snails, Physopsis africanus and Planorbis pfeifferi,

vectors of schistosomes, are abundant in ponds and streams in the interior, but are not found along the coast. Schistosoma hematobium and S. mansoni infections are common in the natives of the interior and the Firestone plantations health centers have reported 40 percent of newly arriving Liberians are affected with schistosomiasis and other related parasitic diseases.

(9) Other -- Other diseases or parasites reported in Liberia are filariasis, chicken pox, infectious hepatitis, venereal infections, tropical ulcer of the skin, a variety of intestinal parasites, leprosy, dermatophytosis, onchocerciasis and kwashiorkor.

(10) Animal diseases transmissible to man -- Although the incidence rates are undetermined, anthrax, brucellosis (Brucella melitensis and B. abortus), rabies and echinococcosis are known to occur in animals. Other animal diseases, not yet identified, may also exist.

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2. Diseases of animals -- Native livestock raisers pay little attention to health of animals and diseases resulting in illness or death are seldom reported. Very little, except preliminary investigation, has been done in determining the extent of diseases or parasitism in animals.

a. Prevalent animal diseases

(1) Anthrax -- Anthrax very probably exists in Liberia but its presence has been determined only by evaluation of the description of gross lesions and symptoms of animal having died. Many descriptive reports of such a disease are recorded.

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(2) Piroplasmiasis -- Piroplasmosis, tick fever, is transmitted by several species of ticks. Although the native cattle are more resistant to the effects of the disease than imported cattle, it still accounts for serious loss in condition and reduced weight gains. Imported cattle are highly susceptible and most of the breeding animals brought into the country have either died from this disease or suffered so seriously that they were useless for breeding.

(3) Trypanosomiasis -- Nagana of cattle, transmitted by the tsetse fly, deters the introduction of useful cattle breeds. The small native animals are resistant to the effects of this disease and many authorities have recommended the development of a livestock industry based on selection of this indigenous stock. Trypanosomiasis, caused by T. simiai, is present in pigs. As is the case in cattle, native stock is resistant but imported pigs introduced for improving the native breed soon succumb to the disease.

(4) Rabies -- Rabies in dogs has been reported in all districts and medical authorities are of the opinion that the disease is enzootic. Wild animals as well as uncontrolled dogs act as a reservoir and little or no vaccination is undertaken.

(5) Parasites -- Innumerable external parasites and a considerable number of internal parasites, in addition to transmitting diseases, take a heavy toll in terms of debility. Few measures are taken to control these pests.

(6) Other -- Other animal diseases which have not been diagnosed but may exist, are contagious bovine pleuropneumonia, cysticercosis, shipping fever and blackleg. Fowl pox, fowl typhoid, coccidiosis, spirochaetosis and bacillary white diarrhea have been reported in poultry.

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D. Medical organization and administration (veterinary)

1. Civilian

a. Organization (veterinary) -- As late as mid 1961, Liberia had made no provision for a veterinary service in its Department of Agriculture and Commerce. Several veterinary technical assistance experts on assignment by the United States aid missions, the United Nations Food and Agriculture Organization (FAO) and an Israeli veterinary consultant to the government, have recommended the development of such a service but no action has been taken. A qualified Liberian veterinarian, educated in the United States, is a missionary attached to the Cuttington College, Monrovia. A modest facility, termed a quarantine and inspection station, staffed by a technician, has been set up near Ganta (7-14N - 8-59W), to check animals entering the country from Guinea, and the Ivory Coast dealers evade the inspection by crossing at unauthorized points.

b. Legal controls

(1) Licensure -- No requirements exist for licensing veterinarians.

(2) Quarantine -- Provisions have been made at one border point, Ganta, and the Port of Monrovia for inspecting and observing animals moving into the country, but regulations are very feeble and most traders evade quarantine through bypassing the facilities.

(3) Inspection -- Inspection of animals or products is not carried out except by lay technicians who have had little formal training. The system permits only token observation of conditions.

c. Professional veterinary organization -- No professional veterinary organization exists in Liberia.

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d. Veterinary research -- No veterinary research has been undertaken in Liberia. Veterinary experts visiting the country have made a few investigations of animal diseases but lacked the tools to pursue these matters in terms of research.

f. Emergency veterinary services -- No emergency veterinary services exist in Liberia.

1/ 5/ 6/ 8/ 17/ 18/ 19/ 22/

E. Medical manpower

1. Personnel -- Although there are 62 physicians and 10 dentists in the country, only two native Liberians have earned degrees as Doctors of Medicine. Over one-third of the physicians are employed by Firestone or other commercial concerns, and about 10 are working as medical missionaries or for the United States Operations Mission and the World Health Organization (WHO). Approximately 15 physicians are on the staff of the National Public Health Service serving in government hospitals or in administrative duties. A few physicians are in private practice in Monrovia. Dentists are either in private practice or in the National Public Health Service.

Liberia has only one veterinarian and he is employed on the staff of the Cuttington College, and has little time for veterinary activities. A few agricultural school technicians have had modest training in animal sanitation and care.

The Tubman National Institute of Medical Arts, Monrovia, has graduated several hundred professional and practical nurses. These personnel serve in the hospitals or provide home care for discharged patients or patients at home for which hospital beds are not available. They also participate in the health education programs and in training midwives. Nursing standards are gradually being raised through more intensive training efforts on the part of the National Public Health Service, the United States Operations Mission and the WHO.

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2. Training -- Doctors and dentists are recruited from overseas. Nursing training is conducted at the School of Nursing of the Tubman National Institute of Medical Arts. Midwives and sanitarians are trained at this institute and at some of the hospitals in the country.

A few para-medical technicians have been trained at the Tubman National Institute of Medical Arts or at the Liberian Institute for Tropical Medicine (LITM), near Roberts Air Field, Harbel, (6-16N - 10-21W), about 30 miles from Monrovia. There is no veterinary training in Liberia but a few agricultural school graduates have had some rudimentary training by veterinary technical experts assigned to the country. A recommendation has been made that Liberians be trained at a little higher level in the veterinary assistants school in Vom, Nigeria. 1/ 6/ 8/ 17/ 18/ 19/

F. Veterinary facilities -- The Department of Agriculture and Commerce Station at Suakoko (7-00N - 9-34W), primarily an agricultural and livestock station, has the only facilities in the country for veterinary investigational work.

Veterinary technical assistants experts have used these modest facilities for training a few Liberians in animal sanitation programs. They have also used the facilities here as a base for a few disease investigations in the field and for a limited amount of disease control or vaccination work. The quarantine station at Ganta has limited use for holding and observing migrant animals.

G. Veterinary supplies -- The few veterinary supplies, medicaments or biologicals used in the country are imported. No veterinary supplies are produced in the country. 5/ 8/ 15/ 19/

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H. Reference data -- Not included in this report.

I. Comments on principal sources

1. Evaluation -- Reliable information on Liberia's health and sanitation problems is not available. The most useful references permit reporting only in a generalized manner. United States Operations Mission reports, a recent report of the Walter Reed Army Medical Center, and a few reports of United Nations specialized agencies, fill some of the gaps left in the incomplete reporting of agencies of the Liberian government.

Material on topography and climate, prepared by the U.S. Department of Agriculture and the Firestone Rubber Company, provides adequate data for the section on those subjects. Most of the information related to nutrition comes from material prepared by these same organizations.

Reporting on human and animal diseases is incomplete and general in character. It appears quite possible that other diseases not described may exist and that the significance of those actually described may be more serious than indicated.

Reports by United States, Liberian and International agencies give the personnel numerical strength of medical organization quite uniformly, but nearly all description of specific responsibilities and distribution are lacking. The same is true of matters dealing with facilities (although some are listed by location) and supplies.

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