

Research on the dromedary in Africa

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Summary: The distribution and importance of the dromedary (Camelus dromedarius) in Africa are described in terms of density and in relation to other domestic animals and to human populations. The current state of research, whether in progress or planned, is given country by country. Proposals are made for the future coordination of research on the dromedary in Africa.

KEYWORDS: Africa - Animal production - Dromedary - Husbandry methods - Research - Veterinary medicine.

INTRODUCTION

The decade of drought which has hit the countries of Sahel and North Africa has brought about a decrease in animal production and in their productivity per inhabitant.

Only in the case of the camel has the number of animals been maintained or even increased. In many countries of the arid zone the dromedary has regained its role of supplier of milk, meat and traction. During the past 25 years, the amount of research on camels has considerably increased, reflecting a growing interest among research workers and governments in this species.

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DISTRIBUTION AND IMPORTANCE OF THE DROMEDARY IN AFRICA

With only a few exceptions, camels belong to arid or semi-arid regions, characterised by rainfall small in amount and brief in duration, and followed by a long dry season (which may last for 8 months).

The dromedary is present in every desert zone of North Africa and their northern boundaries; the Sahel constitutes the southern limit. In western and central Africa this limit may be expressed by the latitude 14°N, or more precisely by the isohyet of 400 mm. In the east, the Horn of Africa has about 35% of the world camel population. Taking into account the particularly arid conditions of this zone, the area of distribution descends as far as the latitude 3° South.

Certain breeds of camel can live in more humid environments; in Africa the main breed is the dromedary of the Nile Delta of Egypt.

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The physiological peculiarities of the dromedary are well known, such as its wide range of body temperature and its water metabolism, and its ability to travel over long distances with less effort than that incurred by other animals, thanks to the structure of the sole of its foot which distributes weight over a large area (particularly suitable for sand), making it the animal best adapted to life in an arid or semi-arid environment.

The stereotyped images of the camel remain linked to that of the Touareg on his 'mehari' (a racing camel), or to the desert camp site of the cameleers at a watering place. Although today the dromedary has practically lost its auxiliary role in the armed forces, it is still preferred by nomads as a source of milk, meat, hide, hair and, of course, transport.

The growth of mechanised transport during the 1950's along with the petrol boom almost completely replaced caravans of camels.

However, the rising cost of motorised transport and the steady increase in demand for milk and meat products, as well as a need for draught animals for oasis husbandry, mean that the camel population of Africa will remain stable, or even increase.

The camel populations of Africa

The area may be divided into three subregions:

East Africa (Djibouti, Ethiopia, Kenya, Somalia, Sudan) covering 2,669,500 km² of arid zone with a population of about 82 million inhabitants. This subregion has the largest camel population in Africa, of about 10 million (according to the FAO Yearbook for 1984).

West Africa (Burkina Faso, Mali, Mauritania, Niger, Nigeria, West Sahara, Senegal and Chad) covering 4,628,600 km² of arid zone, with 125 million inhabitants and about 2,140,000 dromedaries.

North Africa (Algeria, Egypt, Libya, Morocco and Tunisia) with the greatest proportion of arid land, 98% of the 4,527,000 km² covered by these countries. The human population is estimated to be 100 million and the dromedary population 760,000 (FAO 1984).

In relation to other domestic animals, camels represent 13% of the animal population of East Africa (expressed in terms of Tropical Livestock Units, TLU) and between 4.5 and 5.5% in West and North Africa. Such figures must be regarded as crude estimates, for the wide dispersal of camels does not make it easy to count them in censuses.

During the past ten years, certain countries affected by the petrol boom (such as Libya) have experienced a considerable drop in their camel population. Some Sahelian countries have experienced losses from drought between 1970 and 1980. However, in such countries the camels are more resistant to drought than other animals (see the Niamey Colloquium of 1986).

Certain statistics must be viewed with caution. For example, during 1983 a large part of the nomadic camel breeders of Mauritania crossed the frontier into Senegal to seek refuge from the drought. The breeders of Chad, Niger and Cameroon made similar journeys into Nigeria, Central African Republic and Benin.

Recent estimates show a slight increase in populations during the past decade.

CURRENT AND PROJECTED RESEARCH IN INDIVIDUAL COUNTRIES

Algeria

The services of the Ministry of Agriculture and Fisheries are currently conducting a census of the camel population. The role of the dromedary is being reassessed, particularly as a consumer of by-products of crops grown in the newly irrigated zones in southern Algeria. The recent increase in the price of beef and sheep meat may favour an expansion of camel production.

The principal research organisations (Directorate of Veterinary Services, National Agronomic Institute, National Centre for Arid Zone Research, Institute for Saharian Research) had no camel projects in their 1986 programmes, but they have budgeted for the establishment of four camel research stations, with the following aims:

- identification of pack breeds and racing breeds;
- use of camels for traction and milk production in the irrigated perimeter zones;
- study of feeding behaviour of camels in the steppe zone, and plant-animal relationships in such zones.

Burkina Faso

No research on camels is being done in this country, and none is likely to be done in view of the small proportion of camels in the total animal population (0.2%).

Djibouti

The Animal Husbandry and Fishery Service and the Higher Institute for Studies and Scientific and Technical Research (ISERT) are in charge of research and development.

ISERT has recently completed a socio-economic study of camel production. Future research may be undertaken on the productivity of camels and their place in animal production in Djibouti.

Egypt

There is no doubt that Egypt produces the most publications and research on camels. An impressive potential for research is offered by the university network, the Research Institute for Animal Production of the Ministry of Agriculture, the Research Institute for Animal Health, the Desert Research Institute and the Department of Animal Reproduction and Artificial Insemination of the National Research Centre.

Current research projects are:

- physiopathology of reproduction (Prof. Shalash);
- comparison of the adaptation of camels, goats and sheep to the desert conditions of Egypt;
- nutritional ecology of dromedaries and sheep;
- comparison of the physiology of the digestive system of dromedaries and sheep;
- utilisation of by-products of crops by dromedaries.

Future research will deal with:

- ability of camels to convert coarse fodders;
- comparative digestibility *in vitro* of rumen fluid from camels and sheep;
- adaptation of camels to water deprivation and to water rich in salt;
- productivity, with special attention to the survival of young camels;
- lactation, composition of milk and its transformation into milk products;
- diseases of dromedaries (to be studied at the Aswan Quarantine Centre).

Ethiopia

Only the National Veterinary Laboratory is presently conducting research on dromedaries. From time to time students at the University conduct specific studies. The Ethiopian programme of CIPEA deals with the productivity of camels. The Research Group on Small Ruminants and Camels conducts its own projects, in collaboration with similar groups of research workers in Sudan and Kenya.

The National Veterinary Laboratory has carried out and published interesting research on the epidemiology of diseases of dromedaries, and also on their mineral deficiencies. The Virology Unit is studying the virus of camel pox, while the Bacteriology Unit is studying *Salmonella* infections in relation to losses of young camels.

The National Veterinary Laboratory will continue to work along these lines, while the CIPEA will extend its research into husbandry, nutrition and reproduction.

Kenya

Here the production of camel meat and milk forms part of animal production in general, as demonstrated by commercial ranches for breeding camels. Under such conditions it is understandable that various State, international and private organisations have invested in research on camels.

The Veterinary Research Laboratory, Nairobi University, an arid zone project of UNESCO, ILRAD and CIPEA, and numerous other organisations (including private ones) have been conducting research on the following topics:

- trypanosomiasis in camels;
- feeding behaviour and nutritional physiology;
- zootechnical performance;
- management systems for camels;
- attempts to cross the local breed with dairy breeds of Pakistan, reputed to be more productive.

The research in progress defines the major orientations of medium-term research.

Libya

There has been a considerable reduction in the camel population of Libya. Certain research and development projects were undertaken between 1970 and 1980 by a Unit for Animal Production Research of the Directorate General for Agricultural Research and Education and by FAO. There is no recent information concerning the status of these projects.

Mali

Veterinary research in Mali is undertaken by the Ministry of Natural Resources and Animal Husbandry through its specialist services, the National Animal Husbandry Directorate, the National Institute for Zootechnical, Forestry and Hydrobiology Research (INRZFH) and the Central Veterinary Laboratory.

Very little coordinated research has been done by these organisations. However, a conference on camel production has been held, which demonstrates the interest of Mali in this animal.

INRZFH has prepared a proposal for a research station on camels, to be financed externally.

Mauritania

Research on dromedaries is carried out by the Mauritanian Institute for Scientific Research in matters of anthropology, sociology and oral history, and by the National Centre for Animal Husbandry and Veterinary Research (CNERV) in matters of serology, virology, bacteriology and parasitology.

A joint project has been carried out by CNERV and IEMVT to study the traditional husbandry of camel herds. Much information on structure, size and ownership of herds has been collected during the 3 years of the survey. These studies will be extended into the fields of husbandry and pathology, with a view to improving the production of meat and milk.

Morocco

Morocco was planning to import 8,000 camels from Senegal and Mauritania during 1986 in order to build up the population, which has fallen during recent years (partly as a result of drought).

Research is conducted by the Hassan II Agricultural and Veterinary Institute, and by the Veterinary Institute, involving four departments of the former:

- The Department of Animal Reproduction and Artificial Insemination focuses on analysis of reproductive performance in traditional husbandry, and the endocrinological basis of reproduction in males and females.
- The Department of Physiology is studying water balance and thermo-regulatory mechanisms.
- The Departments of Anatomy and Pharmacy are studying the functional anatomy of the dromedary, particularly hepatic structure and function, and the anatomy and biochemistry of salivary glands.

Niger

The National Veterinary Laboratory is investigating parasites of dromedaries. A study of productivity is being conducted as part of a bilateral agreement with IEMVT.

The Ministry of Animal Resources has drawn up a project for a camel research centre in the Tahoua region.

Nigeria

This country lies outside the area of geographical distribution for dromedaries, but there is considerable importation of camel meat across the northern frontier.

Research on camels is done in a number of universities, but more in the form of individual projects for theses than as the result of a well-defined research programme.

Senegal

There is no research on camels at present.

Somalia

This is the most important country in terms of camel population, and research is being done by the Somalian Academy of Arts and Sciences, the Camel Research Project, the Faculty of Animal Production and Veterinary Medicine, and the Institute for Serum and Vaccine Production on the following topics:

- traditional husbandry, ecology, social ecology and anthropology of the camel;
- production, preservation and processing of milk;
- viral and bacterial diseases;
- husbandry and reproduction;
- feeding habits;
- market studies.

All these topics are still under study.

Sudan

As in Somalia, the importance of the camel population has led to research being conducted by the research stations of the Ministry of Animal Resources, the Veterinary Research Service and the Faculty of Veterinary Medicine at Khartoum (with its Camel Research Unit) on biochemical and physiological topics, as well as reproduction, nutrition and metabolism of the dromedary. The studies include diseases, production, productivity and the description of breeds.

Other research projects are scheduled on the same topics, with special attention to studies under field conditions.

Chad

The internal situation in Chad has seriously interfered with research, and no research is being done at present.

Tunisia

The National Institute for Agricultural Research and the Arid Zone Research Institute are responsible for research in Tunisia. They have well-equipped laboratories capable of testing vegetation, feed, milk composition, etc.

Since 1980, research on camels has been conducted for a UNESCO project at the Arid Zone Research Institute, with regard to the following subjects:

- early weaning of young camels;
- supplementation of the diet of pregnant females;
- utilisation of field crop by-products (such as olive pulp and date residues).

Future projects include a study of traditional practices in herd management, and an evaluation of the principal parameters of reproduction under field conditions.

CONCLUSION

There is now a general awareness that research on camels has too long been left at an anecdotal level, to such an extent that this animal has been completely overlooked by development services. The drought of recent years has restored the camel to the agenda. Our analysis has shown that practically every country concerned now has a policy for research into camels, conducted by national research workers. The wide dispersal of research teams and of the animals themselves precludes the notion of creating a single, large centre for such research.

The best approach would be to create a research network, provided with funds sufficient to permit the dissemination of information and the exchange of research workers. This arrangement would make best use of the efforts of these newly established teams.
