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LIVESTOCK DEVELOPMENT IN KERALA

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P R E F A C E

Kerala State has a large livestock population. But the productivity of the livestock is comparatively low since most of the stock is of inferior variety. There is good scope for development of the Animal Husbandry sector in Kerala. The data base in respect of the sector is comparatively weak particularly on important aspects like livestock production, breed-wise population etc. An attempt has been made in this paper to document the available information. The gaps are evident from the discussions made in the paper. Early efforts are called for in the direction of filling up the gaps by conducting scientifically designed surveys.

It is hoped that reviews like these will be of help in highlighting the need for continuous efforts for building up proper statistical base for planning purposes.

This paper has been prepared by Smt S. Suneetha, Research Officer of this Bureau.

Bureau of Economics and
Statistics, Trivandrum.
Dated - 15.4.1976

N. GOPALAKRISHNAN NAIR
DIRECTOR.

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LIVESTOCK PRODUCTS, PRODUCTION, DISPOSAL Etc

I. Introduction

Animal Husbandry is one of the crucial sectors promising immense scope for development in Kerala. However, at present it accounts for only 1.5 percent of the State Income. Development of Animal Husbandry in Kerala is important not only from the nutritional stand point but also from the stand point of its employment potential. While milk, meat and egg help to reduce the protein deficiency in the diet of the people, proper promotion of Animal Husbandry improves the economic status of the rural poor, as the bulk of the bovine population belong to them. Further this will pave the way for the development of certain industries for manufacturing cattle and poultry feed and processing livestock products which in turn will provide higher levels of income and employment in other sectors of the economy.

Kerala is mainly an agricultural territory with its population chiefly engaged in agrarian occupations. With growing population and limited cultivable area, it is absolutely necessary to raise substantially the productivity of our agriculture. Animal Husbandry has an important role to play in agricultural development. The preservation and improvement of the cattle wealth of the State must be an integral part of our scheme for agricultural and economic development. Cows and buffaloes are a vital part of our agricultural economy. The multifarious benefits of the cattle wealth which include the milk produced by the cows, the bullock power utilised for cultivating the land and manure, leather and other by products produced, constitute a tremendous contribution to the States' economy.

The dairy potential in the State still remains to be exploited in full. The per capita availability of milk still remains one of the lowest in the country. This is mainly due to poor genetic material available locally and the dearth of local resources in essential feeds and fodder.

The estimated percapita availability of milk in Kerala is about 55 Grams per day. In order to achieve self-sufficiency in milk even at a per capita requirement of 280 Grams of milk per day, there is need to make a five fold increase in the productivity of the stock, which can be achieved within a foreseeable future only by a programme of mixed breeding with selected exotic dairy type breeds of cattle like Jersey, Brown Swiss, Fecian Marrah etc. by a more extensive use of artificial insemination facilities.

According to 1972 Livestock Census, Kerala State had a total livestock population of 49.37 lakhs as against 46.41 lakhs in 1966. As the cattle and buffalo population remained steady, increase is reflected among other livestock items. On noteworthy feature about the bovine stock is that breeding cows and buffaloes have been on the increase over the last two decades while the number of breeding bulls and other working males have declined. This decreasing trend reveals the impact of cross breeding and artificial insemination facilities provided all over the State by the Animal Husbandry Department. However buffalo-bulls showed a tendency to increase between 1966 and 1972. This is mainly due to the fact that buffaloes are usually used for agricultural operations in the State.

Goat Development also can play an important role in augmenting milk and mutton production. Suitable breeding methods have to be adopted using reputed type breeds of animals. This aspect still remains to be taken up on scientific lines.

Swine production programme provides another important source of meat which can solve to some extent the food problem of the State especially protein malnutrition. There is ample scope for this in Kerala.

II. Livestock condition in India

Although India has one of the largest cattle population (Table-I) of the world, the output per animal is very low. The average annual milk yield per animal in India has been estimated as 220 Kg. as against 4200kg in U.S.A., 4220 Kg. in Netherlands and 3710 Kg. in Denmark ("Indian Farming" - April 1974). Thus

it can be seen that the productivity of Indian cattle when compared to other countries is extremely low. This low level of production has been the result of factors such as the socio-economic conditions of farmers, far from satisfactory breeding, feeding, disease control and unscientific management practices.

In order to increase milk production in the country from about 23 million tonnes of milk per year produced today, to about 40 million tonnes a year in another 10 to 15 years, a large number of high yielding dairy cows with yield averaging more than 2,500 litres per lactation will be necessary. Such animals cannot be produced by selection of Indian stock in such a short period. To double the milk production by selection will take about 70 to 80 years. Importing a large number of high yielding cows from dairying countries of the world is again out of question in view of the large numbers needed in India to make any impact, and the expenses involved. The only alternative is to resort to cross-breeding, using a large Indian female live-stock population to produce offsprings from use of exotic sows in case of Indian cows and resorting to mass selection and use of high yielding buffalo-bulls from better tracts of the country in case of buffaloes.

India has the best dairy type of buffalo in the world. Buffaloes are comparatively high milk yielders as compared to cows. For instance 25 million milch buffaloes produce about 12 million tonnes of milk against 10 million tonnes produces by 50 million cows. It is estimated that the world population of buffaloes is about 12 crores. India's buffalo population is 2.5 crores, that is about one fifth of the world's population. Being tough and hardy, the buffaloes possess good drought ability, whether it be in the snow or in mud, in the plains or in the higher altitudes of over 2000 metres. Important breeds of Indian buffaloes are Mehsana, Surti, Nili, Ravi and Murrah. Many of the dairy plants in India, more particularly in the Northern parts, owe their existence to the milch buffalo. Therefore in our march towards specialised dairy farming, the buffalo has to be not only the stepping stone but also the main spring of the

country's dairy economy for some generations to come.

While the buffaloe has been the mainstay of the Indian dairy industry, especially in the organised sector, it is the cow which has the potentiality to usher in the "White Revolution". Cross-breeding is the means through which the Indian cow is destined to lead us to that cherished goal. There are a large number of breeds of cattle in India, but only three breeds viz. Sahiwal, Sindhi and Tharparker, may be classed as dairy type. Through cross-breeding programmes, a new generation of dairy cattle from the local breed by introducing an adequate proportion of exotic dairy cattle inheritance, which will be suitable for profitable dairy farming and intensive milk production is fast coming up.

According to the IV Plan, the production of milk increased from 20.00 million tonnes in 1966-67 to 21.20 million tonnes in 1968-69." It was anticipated that milk production would reach a level of 25.86 million tonnes by the end of the IV Plan period. The draft Fifth Five Year Plan estimates milk production at 23.20 million tonnes in 1973-74. According to an earlier estimate only about 110 Grams of milk per capita per day was available during the Fourth Plan period, while the Nutrition Expert group for the ICMR recommended 300 Grams for pre-school children, 250 Grams for school children, 200 Grams for adult men and women and an additional 150 Grams for expectant mothers. It has been worked out that the demand for milk in 1981 by our 660 million people will be 151 Grams per capita per day. To meet this demand in 1981, the country will have to produce 36.42 million tonnes of milk per year.

III. Livestock Population in Kerala

In 1972, the total number of livestock in the State was 49,36,469 as against 46,41,375 in 1966. Of this 45,33,981 (91.95 %) were concentrated in the rural areas and the rest in urban areas. The distribution of livestock is given in Table 6.

Among the livestock, cattle formed the largest number (57.86%). Only about 10% of the total number of livestock were buffaloes. The other livestock included pigs, Goats, Horses

and ponnies, mules and donkeys of which goats accounted about 30%.

Bovine Stock:- Total number of bovines in the State was 33,28,067 consisting of 10,49,405 males and 22,78,662 females. Of this 616,401 were working bovines. There were 282 working bovines per 1000 hectares of cultivated area, 156 (134 cattle + 22 buffaloes) bovines per 1000 human population and 1438 working bovines per 1000 ploughs in the State.

Cattle:- Of the entire cattle population 780,679 (27.33%) were males and the rest females. About 50% of the total number of male cattle were young stock and more than 45% of the male cattle were young stock and more than 45% of the male cattle over 3 years were castrated and were used for work. It is interesting to note that only less than 1% of the total number of males come under bulls and bullocks over three years not in use for work or breeding. In the State there were only 4800 (0.62%) bulls over 3 years used only for breeding purpose. There were 2659 female cattle for every 1000 male cattle. About 29% of the total number of female cattle were in milk and 28% were dry as on April 1972. There were 178 working cattle per 1000 hectares of cultivated area. The number of cattle for every 1000 human population was 134 (Table 24). The density of cattle in the State as a whole was 73 per Sq. KM.

Buffaloes:- There were 4,71,747 buffaloes in the State consisting of 2,68,726 (56.96%) males and 200,021 (43.04%) females. Out of the total number of the buffaloes 74% were castrated and used for work only. About 48% of the total buffaloes comes under the group males over three years and 33% comes under female over 3 years. The increase in males over female is mainly due to the fact that buffaloes are mainly used for Agricultural operations in the State. About 41% of the total number of the buffaloes were in milk and 26% were dry as on April 1972. The density of buffaloes in the State as a whole was 12 per Sq. KM. There were 103 working buffaloes per 1000 hectares of cultivated area. The number of buffaloes per 1000 human population was 22.

Ovine stock:- The ovine population in Kerala was 1,477,978 of which 3,25,266 were males and 1,152,712 were females. Out of

the total ovine population 10,321 were sheep and the rest 1,467,657 were goats. The ovine population formed about 30% of the total livestock population. The State had no wool producing sheep. Majority of them were used for the production of mutton. Goats were used both for milk and mutton production. The chief breed of goat in the State was known as Malabari breed. More than 50% of the total number of goats were females in the age group one year and above. Male goats of one year and above formed only 7% of the total goats. The sex ratio of the goats per 1000 male goats was 3556 for the State. The density of goats per Sq.KM. in the State was 38.

There were 129,087 pigs consisting of 58,791 males and 70,269 females. The sex ratio of pigs per 1000 males was 1196 for the State.

As per 1972 census, the total number of cows in milk was 6,06,192 and buffaloes in milk was 83,138. There were 32 bovines in milk per 1000 human population as against 29 bovines in milk in 1966. The cattle population remained almost the same as that of 1966.

Further the number of working animals and ploughs have shown a decrease when compared to 1966. This is evidently due to the fact that mechanisation in agricultural practices has started setting in.

The decrease in certain categories of livestock like sheep, cattle not in use for work or for breeding etc. is due to the heavy rate of slaughter of livestock for human consumption and the increase in other categories is mainly due to the better animal husbandry practices followed.

IV. Livestock Development Measures

(a) Cattle Development Programme:- Majority of the cattle still found in Kerala are of non-descript character. The development is contemplated through upgrading the existing stock and keeping the animals healthy so that their yielding capacity is raised. This is to be achieved by providing necessary infrastructure for cross breeding selected desi-stock, eliminating

the scrub bulls and ensuring adequate veterinary services and feeding. The cross breeding programme will in no way affect the supply of drought animals for Agricultural and other services required in rural areas. In fact cross-bred bullocks will provide better traction power than the "Desi" bullocks. The cross breeding programme needs to be supported by a proper slaughter policy for eliminating the scrub bulls and other undesired animals in a phased manner.

Improvement in cattle means early maturing of the heifers, reduced number of days between two calvings, higher yield of milk in lactation and less number of dry days in the life of a cow. The overall productivity of a dairy herd can be increased by selective breeding, better feeding and better management. The efficiency of a cattle can be increased upto fifty percent by providing adequate quantity of balanced ration.

The cross-breeding programme of Animal Husbandry Department is implemented through the Key Village Blocks, Intensive Cattle Development Blocks and the Indo Swiss Project.

The Key Village Scheme was the first organised effort in India for cattle breeding on a package basis for which a beginning was made in with the First Five Year Plan. The achievements through the successive Plans in the Key Village areas which have since been expanded have been significant and now the stage has come when further measurable progress can be made only by organising more intimate personal contacts with the livestock farmer at his door even in the more remote rural areas where the bulk of the cattle population is concentrated.

During the first three plan periods, 16 Key Village Blocks have been started in Kerala to cover about 1.6 lakhs of breedable cattle out of the total adult female population of about 13 lakhs. The planned utilisation and multiplication of limited superior germ plasm available in the country in an organised manner for general development of cattle through out the country, is the scope and purpose of the Key Village Scheme. Breeding by artificial insemination is the technique adopted which has the advantage of accomplishing the aims and targets

within a limited period. Periodic castration of scrub bulls is a chief function of the Key Village Scheme.

There were 14 Key Village Blocks consisting of 151 sub-centres as on April 1974 (Table 34).

Cross Breeding Scheme:- Under this scheme two centres, with 7 sub-centres each, are functioning in the State. The main centres are at Neyyattinkara in Trivandrum District and the other at Chalakudy in Trichur District. The object of the scheme is to investigate the potential for cross breeding with Jersey strain of cattle in the country for increasing the milk production and to study the various conditions and proportions of exotic blood in the progeny.

Intensive cattle Development Project:- To produce more and better type of cattle within as short a span of time as possible for supporting economic milk production and to eliminate all unwanted stock are the two primary objectives of the scheme with reference to the special need of Kerala. The ultimate object is to evolve a dairy type animal suitable for the local agro-climatic condition by grading up programme using exotic dairy type animals. The programme also plans to provide better feeding, housing and management of the progeny. The State has already one Intensive Cattle Development Project with headquarters at Alwaye. The project covers an area consisting of one lakh breedable cows, divided into four regions covering about the entire Alleppey, Kottayam and Ernakulam districts. There are also proposals to start more I.C.D. Projects in other areas so as to intensify the conversion of local non-descript milch animals into economic dairy animals of better yielding quality. One smaller unit of the project is under implementation at Palghat. It is proposed to set up one more project in the Malabar area comprising the districts of Calicut and Cannanore covering a breedable population of one lakh cows in a compact area. The I.C.D.P. will be located in a suitable area from which other cross-breeding programmes will be kept out.

The Indo-Swiss Project:- The Indo-Swiss Project is a Joint venture by the Government of India, the Swiss Confederation and the State of Kerala. The main objectives of the

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Project are (1) The creation of a new multi-purpose breed of cattle suitable for economic milk production, draught and meat production (2) The improvement and promotion of fodder production to support a better type of cattle, by making full use of the natural resources, especially the grass lands of the High Ranges and (3) The application of the experiences and methods developed in the "Project Farms" in longer area, through extension that aims at the general development and improvement of economic farming in the High Ranges.

The project is located in the High Ranges of Kerala where scarcely populated and still unutilised pasture land is available with good scope for developing economic dairy farming under favourable climatic conditions. The activities of the project commenced in September 1963 at Mattupetti, where a centre for cattle breeding and studies on promotion of fodder resources has been established in an area of about 200 hectares at an elevation of 1700 M. above M.S.L.

The objective to evolve a new breed of cattle is to be achieved by crossing the local animals with pure Brown Swiss as the exotic donor breed. The breeding programme envisages 3 cross breeding phases leading to populations with 50% (F₁), 75% (F₂) and finally 62.5% (F₃) exotic blood, before a progressive selection programme can be started within the F₃ population.

The Brown Swiss cattle, a native of Switzerland is spread over all climatic zones and altitudes of the world. Qualities like heat tolerance and adaptability have enabled their successful introduction in hot and tropical zones. Mostly a breed of milk and meat, which can also be used for draught purposes, it is an animal with an average body weight of 550 to 600 Kg. for mature cows. The average milk yield of a cow is 3500 - 4000 Kg. with 3.8 to 4% butter fat, where as record production exceed 8000 Kg.

The basic breeding programme carried out in the Breeding & Research Centre at Mattupetti was started in 1964 with 140 non-descript local cows and 67 Brown Swiss animals including 22 bulls imported from Switzerland. Later on the Brown Swiss has been considerably enlarged by importing semen from Proven

bulls. In a first phase a gene pool has been built up in which the exotic inheritance is limited to a theoretical average of 62.5 percent. This has been achieved through forward crossing of the local animals to the level of 75 percent exotic blood and subsequent back crossing to the 62.5 percent level (F1 x F2). Through systematic selection over generations the 'new breed' will have to be consolidated and steadily improved further.

Comparison of the main qualities of this animal with the local non-descript shows that it is at least four times better in milk production and more or less equal in draftability.

The Brown Swiss cross breeding programme is being extended to four districts of Kerala and cover a contiguous area with approximately 500,000 breedable cows.

Supported by an intensive fodder development programme - introducing fodder crops in coconut gardens as intercrop - the Indo-Swiss Scheme in Kerala has good chances to make a substantial contribution to the 'White Revolution' in South India.

Livestock Farms:- There are three District Livestock Farms run by the State Animal Husbandry Department. They are (1) District Livestock Farm, Kodeppanakkunnu, (2) District Live Stock Farm, Mannathy and (3) District Livestock Farm Thiruvazhunkunnu. These Farms supply pedigree bulls for natural services, artificial inseminations for improving the non-descript livestock for better milk production. Fodder cultivation is an integral part of the activities of these live stock Farms.

Dry stock Farm:- There are two dry stock Farms in the State. One Farm is at Palode in Trivandrum District and the other is at Kuriottumala in Quilon District. The maintenance of dry animals is unprofitable and so the owners of the cattle are inclined to sell away the dry cows without caring to keep them for further breeding and milk production and so it will adversely affect the cattle wealth of the country. Therefore dry cows are admitted and maintained in the Dry Stock Farms until they are returned either pregnant or after calving. Only a nominal fee of Rs.20/- is charged per month for their maintenance.

(b) Pig Development Programme:

It was in the year 1964-65 that Government of India conceived of Special Development Programmes for increasing the availability of some of the essential food commodities such as meat, milk, eggs, fish, fruits and vegetables etc. Without an active programme for increasing the availability of some of the essential subsidiary foods it would have been impossible to find relief from the overall food shortage in the country as a whole. The need to improve the nutritional standard of diet of the common people to safe guard their well-being was also another immediate consideration. One of the programme recommended for adoption under special development assistance was the establishment of Pig Breeding Farm-Cum-Bacon Factory.

In October, 1964, the State Government sanctioned the scheme for establishing a Pig Breeding Farm-Cum-Bacon Factory at an estimated cost of Rs.20/- lakhs with the following objectives:

(a) To promote pig rearing on scientific lines in the private sector and to make available sufficient number of breeding stock of exotic origin (b) to find out suitable, ready and remunerative market for the pigs produced by the farmers (c) to produce wholesome pork and a variety of pork products under hygienic conditions for the consumers and (d) to organise a suitable agency for the production and sale of pork and pork products at a reasonable cost.

The Pig Breeding Farm was established during the latter half of 1964-65 at Mannuthy in Trichur District with a foundation stock of 100 sows and 10 boars of large white Yorkshire breed for multiplication and distribution of sufficient number of pure-breed piglings to the bonafide farmers. The Intensive Pig Development Block, to be established around the Bacon Factory at a total cost of Rs.8 lakhs. The distribution of piglings to farmers at subsidised rate was begun in February, 1966.

By February, 1965, the location of the Bacon Factory at Koothattukulam was finalised where 25 acres of land were donated to the Animal Husbandry Department, by the Koothattukulam Panchayat in Edayar Village. This factory is the first Bacon Factory

in the country included under the crash programme to go into production. The rated capacity of the factory is two tonnes finished products on 50 pigs a day.

A feed mixing plant with a capacity of two tonnes per hour was also established in the premises of the Bacon Factory, Koothattukulam in March 1968 for the manufacture of balanced pig feed for distribution of pig breeders.

The technical knowhow for the establishment of the factory was made available by the Food and Agricultural Organisation of the United Nations Organisation. The Officers supervising the production are qualified veterinarians with special training in Swine Husbandry and Pork technology. The General Manager of the factory is a foreign trained expert in Pork technology. The factory is equipped with the most modern machinery imported from Denmark as well as procured from indigenous sources. The cost of machinery alone comes to Rs.20 lakhs.

The pig is probably the world's most prolific feed producer. Pork like all lean meats, is an important source of high quality protein and provides a considerable amount of iron and niacin. Pork is also specially important for thiamine. A 100 gm serving of cooked pork provides about one-fourth of the protein and iron, almost one half of the thiamine and two fifth of the niacin equivalent recommended as a daily allowance for a young male adult.

The quality of pork depends on the pig and methods of processing and preservation. Good quality pork is produced from young, well-fed pigs that weigh from 80-100 kg. In order to produce quality products only exotic breed of pigs which satisfy the above requirements are slaughtered in the factory. Pigs are procured from Government farms and approved breeders who are rearing pigs in scientific and hygienic condition through government agencies and approved contractors.

The quality control system introduced in the factory is fully adequate to ensure the manufacture of quality products. The food analysis laboratory attached to the factory is fully equipped to conduct all necessary quality testing. There is a qualified quality control officer and a chemist in the factory to conduct the quality control testing.

The factory produces high quality Bacon, ham and various sausages from selected Yorkshire, Landrace and other exotic breed of pigs weighing about 80-100 kg. Bacon rashers, cooked ham, smoked ham, picnic shoulder, salami, pork sausage, cocktail sausage, oxford sausage, hot dog frank further, garlic sausage are the main products of the factory. It also supplies pork and various green cuts and beef.

The factory products are sold to the consumers through authorised agents in Kerala State, Factory Sale Depot, Trivandrum Factory Sales Counter at Koothattukulam and the Mobile Sale Depot plying in Central Kerala. At present the factory has about 30 agents in Kerala State. Products are also sent to customers outside the State on specific order.

Attached to the Bacon Factory a Carcase Utilisation Plant is also functioning. The inedible materials like bone, blood, internal viscera such as lungs, intestine, stomach, etc. from the slaughter hall contain a lot of protein and it can be converted into valuable food materials for animals and birds.

The process that can be adopted in this plant is "Dry rendering process" for the manufacture of bonemeal and sterilised meat and bonemeal.

The Bacon Factory is proposed to be handed over to the Agro Industries Corporation for a more commercial approach to it.

c) Goat Development.

Goat development can play an important role in augmenting milk and meat production. The average milk yield of goats in the State is very low (.266 gms. per day) compared to the average milk yield of the well-known Indian Breeds, Jamnapari (2.7 Kgs/day), Poetul (1.8 Kg) and Barbari (1.1 Kg/day). If such improved breeds are used for upgrading the local goats, the production of goats milk can be increased several fold within few years.

d) Buffaloe Development Programme.

Milk production enhancement programme in Kerala for the present are confined to cows only. It is felt that buffaloes which account about one-fourth of the milk output in the State

should not be completely neglected. Procurement of pure bred buffaloe bulls for breeding purposes has become a serious problem. Hence a buffaloe breeding farm will be set up during the Fifth Plan period to produce Murrah buffaloe bulls for distribution to the various breeding centres. About 100 numbers Murrah she-buffaloes in first or second lactation and a few Murrah buffaloe bulls will be purchased to use as foundation stock. Buffaloe bulls produced in this farm will be distributed for grading up the existing buffaloe population in the State.

V. Veterinary Services:

In consonance with the development programmes for upgrading the stock, it is essential to check the incidence of diseases among animals. Rearing of new breeds brings in new diseases also. Control of diseases and proper maintenance of health are a must for ensuring the benefits from the Animal Husbandry and Dairy Development Programme.

The Animal Husbandry Department is giving veterinary services through the veterinary Institutions under its control. At the end of the year 1973-74 there were 60 Veterinary Hospitals and 285 Veterinary Dispensaries in the State. In recent years, Mobile Veterinary Dispensaries are functioning in almost all the districts of Kerala. Table-34 shows the number of Veterinary institutions in Kerala.

Rinderpest Eradication Scheme which has been sponsored by the Government of India started functioning in Kerala at Palghat as its Headquarters.

In addition to the above schemes, improvements to the existing Veterinary Hospitals and starting of new Veterinary Hospitals and Dispensaries were also taken up to coup up with the increased demand for Veterinary aid with Clinical Laboratories attached to District Hospitals in a phased manner.

The activities undertaken by these institutions such as artificial inseminations, calves born, castrations etc., during the last few years are presented in Table 35.

VI. Livestock Products and Trade movements:

(a) Milk and Milk Products:

Milk has been described as 'the most nearly perfect food'. It contains all the elements needed for body nutrition and health. Scientists say that a Kilo of milk supplies 364 calories through fat, 187 calories through protein and 198 calories through lactose. The calory is a unit of energy obtained from food. The requirement of calories vary from person to person. It depends on such factors as age, body size, climate and activity. On an average a normal active person needs about 3000 calories a day.

A number of experiments carried out in England, America and India have shown that feeding on milk is comparatively economical than feeding on other food-stuffs. Increased consumption of milk progressively reduces the consumption of other food without ill effect to health. Milk contains all the elements, the human body needs. It gives energy, fat, proteins, vitamins and minerals.

The milk production in Kerala in 1971-72 was estimated at about 4.26 lakh tonnes. This is a very crude estimate. Scientifically designed statistical surveys are required to frame reliable estimates of milk production and consumption in the various regions of the State.

Generally milk is used as fluid milk and in the form of other milk products. People are giving preference for cow's milk for house consumption. As fluid milk, goats' milk is also being used for consumption purposes. Buffaloes' milk has more demand than cow's or goats milk since fat content are more and so for the-preparation of tea and coffee, buffaloes' milk is preferred by tea shops and hotels and as such buffaloes milk is slightly more costlier than cow's milk.

The proteins of goats milk are more easily digested by infants. The fat content of goats milk is also more easily digestible. Goats milk is a mild laxative and 50 percent more rich in Vitamin B, than cow's milk. Somestrees has also been laid on the superior vitamin and mineral content of goats' milk. Its high proportion of butter fat gives goats' milk a greater energy value per unit volume than cow's milk. (Table-33).

The chief milk products of the State are curd, butter and ghee. The quantity of butter consumed by the people is negligible. Almost the whole of butter produced in the State is converted into ghee. Buffaloes milk gives more quantity of ghee than cow milk because of its richer fat contents.

Marketing organisations set up for milk and milk products:

The marketing of milk is attended to in the Milk Supply Schemes undertaken by the Dairy Development Department. The Milk Supply Unions collect the milk from the local milk producers. The distribution of pasturised milk in Aluminium capped bottles was undertaken through milk booths located in the different parts of the major cities. In other parts of the State, the surplus milk available is collected and transported to the markets by cycles or vans.

The infrastructural facilities set up for milk processing to marketing comprise six dairy plants and twelve milk chilling centres. The total handling capacity of the dairy plants is 51,000 litres and that of the chilling plants 29,400 litres per day. The milk handled in 1974-75 was 407.69 lakh litres, the utilisation of the installed capacity being 58%. The milk handled by the chilling plants constituted 37.28 lakh litres, the capacity utilised being 35%.

(b) Livestock products other than milk and milk products:

The main livestock products other than milk and milk products are meat, bones and hoofs, bone meal, horns, hides and skins and manure. Elephant tusk is also an important item. The majority of the sheep available in the State is of mutton type and of no wool value.

The output of livestock products other than Dairy and Dairy products has been estimated from the number of animals slaughtered, fallen animals etc. Data on animals slaughtered in the licensed slaughter houses are collected. But it has to be noted that considerable number of animals are slaughtered privately in a clandestine manner. The estimates for the year 1973-74 is given in Table 31.

There were 715 licensed slaughter houses in the State as on April 1972. More than five lakhs of animals were slaughtered during the year 1974 in the recognised slaughter houses and meat

stalls of the State. Of this more than 2.5³ lakhs were slaughtered in the urban areas and the rest in the rural areas. Of the total animals slaughtered 1.99 lakhs were bovines and 3.10 lakhs were ovines. The number of animals slaughtered during the last few years are given in Table 30. But these data cover only a part of the cases of slaughter since ~~slaughter~~ slaughter is very common in the State.

In the State some private undertakings have started the collection of bone and converting it into bone meal. The Khadi and Village Industries Board gives loans for the starting of bone crushing units.

Trade movements:

Reliable data on trade movement of livestock and livestock products are lacking. Data on movement of cattle from Kerala and into Kerala by road for the past few years, collected by the Animal Husbandry Department are given in Tables 36 and 37. The Animal Husbandry Department has been taking some efforts to collect data on the movement of livestock and livestock products through rail also. The data that could be collected by them are given in Table 38.

VII. Dairy Development:

In the State generally milk is obtained from cattle, buffaloes and goats. Kerala had a breedable stock of 12.9 lakhs cows and 1.5 lakh she buffaloes in 1972. The total population of bovines in milk in 1972 was about 7 lakhs (21% of the total stock).

A sample survey for the estimation of annual production of milk and study of bovine and goat practices was conducted by the Animal Husbandry Department in 1964-65. Based on the sample survey, the average milk yield is estimated at 1.11 kg. per day for the desi cow, 2.01 kg. per day for the she buffaloes and 0.27 kg. per day for the goat. Over the past one decade, as a result of the activities of the Indo-Swiss Project, the Key Village Blocks and the ICDF, there have been improvements in the quality of the breed on the cattle in selected areas. However, all these could touch only a fringe of the problem of upgrading the entire stock. The estimate of cross-bred cows in milk in 1974 stood at 1.12 lakhs covering about 18% of the total cows in production in the State. The superiority of the cross bred stock over the desi

varieties has been clearly proved. They yield 6 to 8 kg. of milk per day.

As mentioned earlier the milk production in the State in 1971-72 was estimated at 4.26 lakh tonnes yielding about 55 gms. per day per head. At the national level, the per capita availability stood at 110 gms. per day and the world average was as high as 300 gms. per day. Nutritional Standard prescribed for India call for a daily per capita requirement 210 gms. Accordingly the State needs a production of 19 lakh tonnes of milk in 1978-79.

The cross-bred cows yield 3000 kg. of milk per lactation, and the average cross bred cows 2500 kg. while the buffaloes yield 2000 kg. But in actual field conditions under a massive programme the yield may well be lower. With a productivity of 1500 kg. of milk per cow/buffaloe 13 lakh animals in milk are required for the State to achieve self sufficiency in milk in 1978-79.

With the yield increased to 2000 kg., the number of milch animals required could be reduced to 10 lakhs and further to 8 lakhs at 2500 kg. per lactation. The total bovine population in an ideal situation is estimated to be four times the number of animals in milk of double the number of the entire breedable female stock.

Under the Special employment programme of Kerala for 1972-73, a massive cross-breeding scheme to cover one million cattle of breedable-age by artificial insemination using semen from exotic bulls of high production potential has been taken up for implementation. This programme is in addition to the breeding activities implemented under the ICDP and other programmes of the Animal Husbandry Department and the Indo-Swiss Project. It is expected that 50% of these cows will calve at the end of the Fifth Plan and milk production on this account will be about 7.9 lakh tonnes. The productivity per cross bred cow is assumed at 1500 kg. per annum as against 2500 kg. expected at the national level. The buffaloes, desi cows and other livestocks are expected to give an yield of about 2.1 lakh tonnes raising the total ~~population~~ production of milk in the State to 10 lakh tonnes in 1978-79.

Dairy Development is an integral part of Animal Husbandry development. The Department of Dairy Development is now mainly concerned with the establishment and operation of Milk processing plants in all major urban centres in the State for the distribution of pasteurised milk to the consumers and simultaneously with the development of milk production in rural areas to improve the availability of sufficient quantity of milk for the operation of the milk processing plants. The Department Commencing its activities from the year 1962 has so far established six milk processing plants (each in Trivandrum, Calicut, Ernakulam, Kottayam, Palghat and Alleppey Districts). All the above six plants are in regular operation supplying pasteurised milk to the consumers in sealed containers.

In order to provide marketing facilities for the milk produced in rural areas and also to facilitate the procurement of milk for the Urban Dairy Plants, the Department has a scheme to install milk chilling centres in rural areas having potentiality for the development of milk production. Under this scheme, twelve milk chilling centres have been established and are in operation.

For the dissemination of scientific knowledge among milk producers in regard to scientific breeding, feeding and management of cattle, clean milk production etc, the Department has undertaken a scheme of Rural Dairy Extension and 15 Dairy Extension Service Units are now in operation in the State. Under the extension service scheme, in addition to rendering advisory services, the milk producers are organised into co-operatives and financial assistance by way of loans and subsidies are given to the co-operatives for the purchase and distribution of cattle feed, for the construction of milking sheds, for the purchase of utensils etc.

One of the greatest and most difficult bottlenecks in the way of improving milk production of cattle is inadequate fodder production for providing sufficient nutrition to the animals. A great deal of attention has been paid to find out ways and means of overcoming the acute shortage of cattle feeds. However due to the limited cultivated land available for raising fodders and

grasses and the increasing tendency to divert even the available land to food and cash crops, it has not been possible to make much progress in solving the problem of fodder shortage. It has, therefore become urgent and necessary to modify the present farming and cropping practices so as to obtain the maximum possible yield of highly nutritive fodders out of the limited acreage available.

To encourage milk production on economic lines the Department has taken up a scheme for fodder development also. Under this scheme, a fodder farm has been established at Valiyathura, Trivandrum and this farm is producing and distributing about 10 tonnes of grass per day to the milk producers in and around Trivandrum at a comparatively low price. Another fodder farm has been established at Ayyampallikunnu, Trichur and steps have been taken up for the establishment of a third fodder farm at Palghat.

It is also expected that during the Fifth Plan Period, the centrally sponsored scheme of subsidised rearing of cross-bred calves will be extended to Kerala for the benefit of the small and marginal farmers and agricultural labourers.

VIII. Conclusion.

Animal Husbandry is one of the sectors capable of bringing about speedy economic and social transformation in the rural areas. Considering the enormous development potential of this sector, there is every need for a more comprehensive and systematic planning for the full exploitation of this field. A closer co-ordination between the Animal Husbandry and Dairy Development Departments in the activities like cross breeding of cows, fodder development, calf rearing etc. would ensure the successful implementation of the Plan Programmes.

An attempt has been made above to present a broad picture of the Animal Husbandry sector in Kerala. The available data have also been mostly documented.

The non-availability of reliable statistics relating to important aspects of livestock economy is one of the hindrances to the proper formulation of development programmes and assessment of the impact of these programmes. Reliable data on milk yield, production of eggs and meat, number of improved animals, incidence of disease among animals etc., are necessary on a regular and continuing basis.

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Table No. 1.
Livestock population in selected countries 1967-68.
('000 head)

Country	Cattle	Pigs	Sheep	Horses(h)	Asses	Total	% share in world livestock population
China	62950	213000	70000	9300	11100	366250	12.7
U.S.S.R.	97167	50867	122461	8025	..	294520	10.2
India	176100	4890	42250	1050	1230	225520	7.8
U.S.A. (C)	109152	55265	22140	7000	..	193557	6.7
Brazil	89896	63406	23008	14042	2971	193380	6.7
Australia	19182	2056	166912	475	..	188675	6.6
New Zealand	8247	614	60471	84	..	69410	2.4
Mexico	35000	14950	6708	7210	3600	67508	2.3
Turkey	14165	..	35878	1442	1965	53450	1.9
South Africa	11500	1700	32262	510	345	52317	1.8
Pakistan	36000	94	11050	497	925	48566	1.7
Ethiopia	25800	..	12500	2760	3800	44860	1.6
France	21417	9746	9248	1046	41	41488	1.4
West Germany	13931	19033	810	282	..	34106	1.2
Uruguay	8350	390	21500	440	..	30670	1.1
U.K. (C)	12151	7387	28004	140	..	47682	1.7
WORLD	1091017	696566	1059013	76254	41955	2874805	100.0

Source: United Nations Statistical Year Book 1969.

Table No.2.

Livestock and Poultry in India - (No. in lakhs)

Items	1961	1956	1961	1966
I. Cattle:				
(a) Males over 3 years	618	649	725	733
(b) Females over 3 years	499	499	542	547
(c) Young stock	436	438	488	480
Total - Cattle	<u>1553</u>	<u>1527*</u>	<u>1755</u>	<u>1760</u>
II. Buffaloes:				
(a) Males over 3 years	68	65	77	82
(b) Females over 3 years	219	224	250	261
(c) Young stock	147	161	185	186
Total - Buffaloes	<u>434</u>	<u>450</u>	<u>512</u>	<u>529</u>
III. Sheep.	390	392	402	420
IV. Goats	472	554	609	646
V. Horses and ponies	15	15	13	12
VI. Other livestock	64	68	73	72
Total - Livestock	<u>2928</u>	<u>3066</u>	<u>3364</u>	<u>3439</u>
Poultry	735	948	1143	1151

* Includes 86,200 for which details are not available
 Source: Ministry of Food, Agriculture Community Development and Co-operation.

Livestock population in India - 1966 census

Region	Cattle over 3 yrs.				Buffaloes over 3 years		Total breeding cows		per 100 of population	total live-stock	percentage to total livestock
	Total males	breeding cows	total males	breeding cows	(3)+(4)	per 100 of population	total live-stock	percentage to total livestock			
	1	2	3	4	5	6	7	8	9		
1. Andhra Pradesh	5407	3830	1460	3114	6944	17	31595	9.2			
2. Assam	2510	1823	241	160	1933	14	9279	2.7			
3. Bihar	6931	3814	732	1574	5388	10	28655	8.3			
4. Gujarat	3101	1762	35	1801	3563	15	14338	4.2			
5. Haryana	918	611	35	1009	1620	17	5523	1.6			
6. Jammu and Kashmir	553	646	42	242	888	23	4079	1.2			
7. Kerala	520	1210	254	129	1339	7	4641	1.3			
8. Madhya Pradesh	9203	7136	1237	2303	9439	25	38478	11.2			
9. Maharashtra	6650	4481	340	1711	6192	13	25449	7.4			
10. Mysore	3666	3118	289	1671	4789	18	20486	6.0			
11. Nagaland	20	22	2	(a)	22	5	215	0.1			
12. Orissa	4397	3159	598	333	3497	17	16422	4.8			
13. Punjab	1290	825	251	1436	2311	17	7481	2.2			
14. Rajasthan	4092	4779	154	2136	6915	29	37475	10.9			
15. Tamil Nadu	4947	2852	502	1231	4083	11	24569	7.1			
16. Uttar Pradesh	13231	6710	1429	5955	12665	15	49972	14.5			
17. West Bengal	4909	4083	532	276	4359	11	19266	5.6			
18. Union Territories	1979	911	58	379	1290	12	5940	1.7			
INDIA	73323	51772	8191	25515	77287	15	343868	100.0			

(a) Less than 500 Source: Planning series No. 1 Agriculture - published by state Planning Board and BES.

Per capita per day availability of Milk Proteins in gms. in 1966.

States	Human population in 1966 millions	Milk Cows	Milk Proteins	Milk Buffalo	Total Milk proteins		
1	2	3	4	5	6	7	8
1. Andhra Pradesh	40	21	0.7	50	2.2	71	2.9
2. Bihar	52	37	1.2	47	2.0	84	3.2
3. Gujarat	24	53	1.7	131	5.6	184	7.3
4. Kerala	19	28	0.9	7	0.3	35	1.2
5. Madhya Pradesh	37	36	1.2	48	2.1	84	3.3
6. Maharashtra	45	17	0.5	40	1.7	57	2.2
7. Mysore	27	33	1.1	41	1.8	74	2.9
8. Orissa	20	28	0.9	12	0.5	40	1.4
9. Punjab	24	78	2.5	253	11.1	336	13.6
10. Rajasthan	23	134	4.3	131	5.6	265	9.9
11. Tamil Nadu	37	34	1.1	31	1.3	65	2.4
12. U.P.	83	32	1.0	97	4.2	129	5.2
ALL INDIA	499	40	1.4	65	2.8	105	4.2

Source: Planning series No.1 Agriculture - Published by State Planning Board and P.S.S.

Table No.5.

Livestock population in Kerala
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Item	No. in thousands as per				
	1951 census	1956 census	1961 census	1966 census	1972 census
1	2	3	4	5	6
Cattle (a) Males over 3 years					
i. Breeding bulls	7.8	11.0	11.2	6.9	4.8
ii. Working bullocks	571.3	553.2	531.9	503.7	382.5
iii. Not used for breeding or work	36.3	37.7	26.1	8.9	4.3
Total	615.2	601.9	569.2	519.5	391.6
(b) Females over 3 years					
i. Breeding cows (a) in milk	316.5	396.4	434.5	423.4	606.2
(b) Dry and not calved	569.1	575.3	644.6	727.0	680.7
ii. Working cows	3.9	7.1	14.3	3.6	7.6
iii. Used for breeding or work	13.7	19.2	39.4	5.2	5.7
Total	903.2	998.0	1132.3	1219.2	1300.2
(c) Young stock	665.3	910.5	934.4	1112.0	1164.5
Total cattle	2184.9	2510.4	2636.4	2256.7	2856.4
Buffaloes: (a) Males over 3 yrs.					
i. Breeding	3.2	4.0	3.1	1.1	2.2
ii. Working	252.7	247.3	263.2	246.1	220.1
iii. Not used for breeding or work	11.3	5.9	6.6	6.7	3.4
Total	267.2	257.2	277.9	253.9	225.7
(b) Females over 3 years					
i. Breeding (a) in milk	53.4	61.3	60.6	66.7	83.2
(b) Dry and not calved	60.3	63.8	61.6	61.9	64.2
ii. Used for work	9.6	10.1	5.2	4.6	6.1
iii. Not used for breeding or work	3.3	3.3	5.2	1.6	2.4
Total	126.6	138.5	136.2	134.8	155.9
(c) Young stock	73.5	91.9	71.3	82.6	90.2
Total Buffaloes	467.3	487.6	485.4	471.3	471.8
Sheep	432.2	97.3	30.2	11.5	30.3
Goats	412.8	955.6	1252.1	1139.2	1467.7
Pigs	124.7	113.7	146.5	111.9	129.1
Others:	1.3	3.1	..	0.4	1.2
Total Livestock	3623.6	4163.2	4606.8	4641.0	4936.5

Source: Planning series No.1 Agriculture and Livestock census Report 1972.

Table No.6.

A. Comparative study of the IXth, Xth and XIth Quinquennial livestock census relating certain important items of livestock of Kerala.

Item	1961	1966	1972	% 1972/ 1966	% 1972/ 1961
1	2	3	4	5	6
A. Cattle					
1. Males over 3 years	566031	519523	391594	75.38	69.12
2. Females over 3 years	1161986	1219242	1300171	106.64	111.90
3. Young stock Total	1025148	1117962	1164555	104.17	113.60
4. Total Cattle - Male	978529	912057	730679	85.50	80.12
5. Female	1779636	1943670	2075641	106.79	116.63
6. - Total	2758165	2856727	2856320	99.99	103.75
B. Buffaloes:					
7. Males over 3 years	285112	253850	225729	88.92	79.17
8. Females over 3 years	135113	134770	155780	115.59	115.30
9. Young stock Total	64864	82615	90233	109.23	139.12
10. Total buffaloes Male	320125	295742	268726	90.87	83.94
11. Female	164964	175408	203021	115.68	123.07
12. Total	485089	471235	471747	100.11	97.25
C. Bovines:					
13. Total Bovine Male	1293654	1208799	1049405	86.81	81.12
14. Female	1244600	2119163	2278662	107.53	117.18
15. Total	3238254	3327962	3328067	100.00	102.77
D. 16. Sheep: Total	24241	11519	10321	89.60	42.54
E. 17. Goats Total	1312262	1182218	1467657	123.41	111.84
F. 18. Horses and ponies Total	408	426	451	105.87	110.54
G. 19. Mules - Total	31	8	14	175.00	45.16
H. 20. Donkeys Total	377	310	861	277.74	228.38
I. 21. Camels Total	..	4	11	275.00	..
J. 22. Pigs Total	122381	111923	129087	115.33	105.48
Livestock 23. Total Livestock	4697954	4641375	4936469	106.36	105.08

Source: Report on Livestock Census - 1972.

Table No. 7.

Statement showing the details of livestock in Kerala state during 1972.

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	Tvm.	Qln.	Alpy.	Ktm.	Idikki	Tr.	Pgt.	Mlpm.	Kzde.	Cunr.	Total
Cattle:											
Bulls	34368	88700	53256	51440	24714	77410	100033	68919	64631	112408	790679
Female	132225	292908	282634	214957	101417	145271	179945	110047	188774	259730	2075641
Total	166593	381617	335990	269397	136131	222681	279978	178966	248405	372138	2856320
Buffaloes											
Males	17185	12021	6804	2565	3480	35590	106339	38434	13769	20377	268726
Females	27323	16842	7088	5784	8730	28439	38566	24736	13247	21621	209302
Total	44508	28864	13892	8349	12210	64029	144905	63170	27016	41998	471747
Goats	945	1074	840	323	204	84	6424	24	80	171	10321
Pigs	148700	178392	99906	147317	61242	143404	135871	137208	137326	115613	1467657
Horses and Ponies	104	40	13	12	2	27	96	28	86	33	451
Birds	14001	964	148	43348	25666	2141	430	86	3772	6285	129087
Other livestock	25	3	70	..	157	107	427	10	8	..	886
Total livestock	374936	591454	450859	468751	235612	432473	568131	379492	416303	536238	4936469

Source: Report on livestock census - 1972.

Table No.8.

Statement showing the density of livestock population in Kerala during 72
.....

Sl.No.	State/District	Density per sq.km.
1.	Kerala State	127
2.	Trivandrum	171
3.	Quilon	128
4.	Alleppey	289
5.	Kottayam	214
6.	Idikki	46
7.	Ernakulam	203
8.	Trichur	143
9.	Palghat	129
10.	Malappuram	104
11.	Kozhikode	112
12.	Cannanore	94

Table No.9.

Statement showing the percentage distribution of bovines in
the rural and urban areas of the state - 1972.
.....

Sl.No.	Name of District	Percentage distribution of bovines	
		Rural	Urban
1.	Kerala State	92.57	7.43
2.	Trivandrum	83.83	16.17
3.	Quilon	96.27	3.73
4.	Alleppey	90.60	9.40
5.	Kottayam	93.13	6.87
6.	Idikki	97.29	2.71
7.	Ernakulam	86.39	13.61
8.	Trichur	93.57	6.43
9.	Palghat	94.33	5.67
10.	Malappuram	96.59	3.41
11.	Kozhikode	88.73	11.27
12.	Cannanore	94.93	5.02

Source: Report on livestock census 1972.

Table No. 10.

Statement showing the percentage distribution of buffaloes in the different districts of the state 1972.

.....

Sl. No.	Name of district	Total cattle	Percentage distribution of cattle			
			Males over three years	females over three years	Young stock males 3 years and under	Females 3 years and under
1.	Kerala (State)	100.00	100.00	100.00	100.00	100.00
2.	Trivandrum	5.83	3.58	6.80	5.23	6.49
3.	Quilon	13.36	9.06	13.73	13.69	14.77
4.	Alleppey	11.76	3.01	13.63	10.63	12.59
5.	Kottayam	9.43	3.31	10.20	10.66	10.62
6.	Idikki	4.77	3.10	5.04	5.81	4.62
7.	Ernakulam	9.26	14.12	7.95	9.36	8.94
8.	Trichur	7.80	12.10	6.54	7.71	7.76
9.	Palghat	9.80	15.12	9.14	10.50	7.87
10.	Malappuram	6.27	12.15	5.63	5.47	4.75
11.	Kozhikode	8.70	8.26	9.33	8.30	8.06
12.	Gannanore	13.02	16.13	12.51	12.58	12.53

Source: Report on Livestock census 1972.

Table No.11.

Comparative statement of percentage distribution of cattle in 1966 and 1972 in Kerala state & Districts.

Sl.No.	Name of District	<u>Age distribution of cattle</u>	
		1966	1972
1.	Kerala State	100.00	100.00
2.	Trivandrum	5.20	5.83
3.	Quilon	12.61	13.36
4.	Alloppy	11.41	11.76
5.	Kottayam	13.29	9.43
6.	Idikki	..	4.77
7.	Ernakulam	10.61	9.26
8.	Trichur	7.77	7.80
9.	Palghat	11.30	9.80
10.	Malappuram	..	6.27
11.	Kozhikode	13.71	8.70
12.	Cannanore	14.10	13.02

Source: Report on Livestock census 1972.

Table No.12.

Statement showing the distribution of male cattle according to use - 1972.

	number	percentage
1. Total male cattle	780679	100.00
2. Males over 3 years used for breeding only	4300	0.62
3. Males over 3 years used for breeding and work	10564	1.35
4. Males over 3 years used for work only (castrated)	358462	45.92
5. Males over 3 years used for work (un castrated)	13510	1.73
6. Bulls & Bullocks over 3 years not in use for breeding or work	4253	0.54
7. Young stock (Males) 3 years & under	389085	49.84

Source: Report on Livestock census - 1972.

Table No.13.

Distribution of female cattle according to use in the state 1972.
.....

	<u>Number</u>	<u>percentage</u>
1. Total Females (cattle)	2075641	100.00
2. Cows over 3 years (in milk)	606192	29.21
3. Cows over 3 years (Dry)	578327	27.89
4. Cows over 3 years not calved even once	101849	4.91
5. Cows over 3 years used for work only	7546	0.37
6. Cows over 3 years not in use either for work or breeding	5657	0.26
7. Young stock (Female) 3 years and under	775470	37.36

Source: Report on Livestock Census - 1972.

Table No.14.

Comparative Statement of percentage distribution of Buffaloes in the various districts in 1966 and 1972.
.....

<u>District.</u>	<u>percentage distribution of buffaloes</u>	
	<u>1966</u>	<u>1972</u>
1. Kerala	100.00	100.00
2. Trivandrum	9.07	9.43
3. Quilon	5.73	6.12
4. Alleppey	3.32	2.94
5. Kottayam	3.86	1.77
6. Idikki	..	2.59
7. Ernakulam	4.47	4.83
8. Trichur	14.02	13.57
9. Palghat	35.71	20.72
10. Malappuram	..	13.39
11. Kozhikode	14.04	5.73
12. Cannanore	9.78	8.91

Source: Report on Livestock Census 1972.

Table No. 15.

Statement showing the percentage distribution of buffaloes in the different districts in the state - 1972.

.....

District/State	Total buffaloes	males over 3 years	Females over 3 years	Young stock males 3 years & under	Young stock females 3 years and under
1. Kerala	100.00	100.00	100.00	100.00	100.00
2. Trivandrum	8.43	6.21	13.47	7.37	13.41
3. Quilon	6.12	4.17	8.25	6.07	8.44
4. Alleppey	2.94	2.64	3.68	1.97	2.86
5. Kottayam	1.77	0.86	3.01	1.43	2.33
6. Idikki	2.59	0.83	4.34	3.73	4.16
7. Ernakulam	4.83	4.64	5.53	3.91	4.30
8. Trichur	13.57	13.52	12.80	11.77	18.00
9. Palghat	30.72	39.93	19.26	37.67	18.13
10. Malappuram	13.39	14.57	12.13	12.90	12.35
11. Kozhikode	5.73	5.08	6.87	5.33	5.40
12. Cannanore	8.91	7.55	10.66	7.85	10.62

Source: Report on Livestock Census 1972.

Table No.16.

Classification of male Buffaloes according to use in the state 1972.

	<u>Number</u>	<u>percentage</u>
1. Total male buffaloes	268726	100.00
2. Male buffaloes over 3 years used for breeding only	2185	0.81
3. Male buffaloes over 3 years used for breeding and work	8686	3.23
4. Male buffaloes over 3 years used for work only (castrated)	200013	74.43
5. Male buffaloes over 3 years used for work (Uncastrated)	11454	4.26
6. Male buffaloes over 3 years not in use for breeding or work	3391	1.26
7. Male buffaloes 3 years and under	42997	16.01

Source: Report on Livestock Census 1972.

Table No.17.

Statement showing the classification of female buffaloes according to the use in the state 1972.

	<u>Number</u>	<u>percentage</u>
1. Total female buffaloes	203021	100.00
2. Female buffaloes over 3 years (in milk)	83138	40.94
3. Female buffaloes over 3 years (in Dry)	53671	26.44
4. Female buffaloes over 3 years not calved even once	10495	5.17
5. Female buffaloes over 3 years used for work only	6066	2.99
6. Female buffaloes over 3 years not in use for work or breeding	2360	1.19
7. Young stock (Female) of 3 years and under	47241	23.27

Source: Report on Livestock Census - 1972.

Table No.18.

Distribution of goats in the different districts - 1972.

State/ District	Total goats	Goats 1 year & above		Goats below 1 year	
		Male	Female	Male	Female
Kerala State	100.00	100.00	100.00	100.00	100.00
Trivandrum	10.14	9.45	10.23	8.80	10.76
Quilon	12.19	10.49	12.21	11.98	12.70
Alleppey	6.81	4.91	7.09	5.96	7.23
Kottayam	10.04	7.69	10.43	10.05	9.92
Idikki	4.17	6.10	4.01	4.46	3.82
Ernakulam	11.10	10.40	10.86	12.12	11.17
Trichur	9.77	8.71	9.60	10.34	10.05
Palghat	9.26	14.45	9.22	8.83	8.21
Malappuram	9.35	9.04	9.59	9.25	9.05
Kozhikode	9.37	9.12	9.31	9.54	9.44
Cannanore	7.80	9.64	7.40	8.62	7.65

Source: Report on livestock census - 1972.

Table No.19.

Comparative statement of percentage distribution of goats in the different districts during the years 1966 and 1972.

State/ District	percentage distribution of goats	
	1966	1972
1. Kerala	100.00	100.00
2. Trivandrum	10.79	10.14
3. Quilon	11.53	12.19
4. Alleppey	6.75	6.81
5. Kottayam	13.46	10.04
6. Idikki	..	4.17
7. Ernakulam	12.06	11.10
8. Trichur	9.73	9.77
9. Palghat	13.31	9.26
10. Malappuram	..	9.35
11. Kozhikode	13.79	9.37
12. Cannanore	8.53	7.80

Source: Report on Livestock Census - 1972.

Table No.20.

Statement showing the percentage distribution of pigs in the districts and state during 1966 and 1972.

State/ District	<u>percentage distribution</u>	
	1966	1972
1. Kerala	100.00	100.00
2. Trivandrum	6.58	10.85
3. Quilon	0.89	0.75
4. Alleppey	0.09	0.11
5. Kottayam	50.38	33.58
6. Idikki	NA	19.88
7. Ernakulam	37.53	24.98
8. Trichur	2.04	1.66
9. Palghat	0.59	0.33
10. Malappuram	NA	0.07
11. Kozhikode	0.85	2.92
12. Cannanore	1.05	4.87

Source: Report on livestock census - 1972.

Table No.21.

The distribution of Bovines per 1000 hectares of cultivated area
of the state 1972.

Name and District	Total No. of bovines	Total No. of working bovines	Total cultivated area (in hect.)	No. of bovines per 1000 hect. of cultivated area	No. of working bovines per 100 hect. of cultivated area
1. Kerala	3328067	616401	2187029	1522	282
2. Trivandrum	211101	27597	153409	1376	180
3. Quilon	410481	43822	230013	1785	191
4. Alleppey	349882	17194	163846	2135	105
5. Kottayam	281316	22322	321077	1188	70
6. Idikki	..	..	..	..	..
7. Ernakulam	328001	70986	222530	1492	319
8. Trichur	226710	77412	138179	2075	560
9. Palghat	424883	151243	287149	1480	527
10. Malappuram	242136	82529	210138	1152	393
11. Kozhikode	275421	44687	157765	1746	283
12. Cannanore	414136	73609	302923	1367	260

Source: Report on livestock census - 1972

Table No.22.

The No. of cattle per 1000 hectares of cultivated area - 1972.

State/ District	Total No. of cattle	Total No. of working cattle	No. of cattle per 1000 hect. of cultivated area	No. of working cattle for 1000 hect. of cultivated area
1. Kerala state	2856320	390182	1806	178
2. Trivandrum	166593	13756	1086	90
3. Quilon	381617	34574	1660	150
4. Alleppey	335990	11344	2051	69
5. Kottayam	362358	18945	1129	59
6. Idikki	..	..	..	..
7. Ernakulam	307594	60252	1382	271
8. Trichur	222681	47180	1612	341
9. Palghat	279973	60696	975	211
10. Malappuram	173966	42334	852	230
11. Kozhikode	248405	33190	1575	210
12. Cannanore	372138	61861	1228	204

Source: Report on livestock census - 1972.

Table No.23.

The No. of working buffaloes per 1000 hectares of cultivated area - 1972.

State/ District	Total No. of buffa- loes	Total No. of work- ing buffa- loes	No. of buffa- loes per 1000 hectares of culti- vated area	No. of working buffaloes per 1000 hect. of cultivated area
1. Kerala State	471747	226319	219	103
2. Trivandrum	44508	13841	290	90
3. Quilon	23864	9248	125	40
4. Alleppey	13222	5350	85	26
5. Kottayam	15958	3377	59	11
6. Idikki	..	..	..	..
7. Ernakulam	24407	10734	110	48
8. Trichur	64029	30232	463	219
9. Palghat	144905	90547	505	315
10. Malappuram	63170	34145	301	162
11. Kozhikode	27016	11497	171	73
12. Cannanore	41998	16748	159	55

Source: Report on livestock census - 1972

Table No.24.

The distribution of cattle/bovines per 1000 human population in the different districts of the state 1972.

State/District	No. of human popula- tion	Cattle/Bovines per 1000 human population			
		Total No. of bovines	Total No. of cattle	No. of bc- vines per 1000 hu- man po- pulation	No. of c- attle pe- r 1000 hu- man po- pulation
1. Kerala State	21347375	3328067	2250320	156	134
2. Trivandrum	2193606	311101	166393	96	75
3. Quilon	3413221	410481	381617	170	158
4. Alleppey	2125722	343832	134390	165	153
5. Kottayam	1529000	277746	220397	180	173
6. Idikki	765608	143311	134181	194	178
7. Ernakulam	2163647	237230	244424	133	122
8. Trichur	2128797	283710	222381	135	105
9. Palghat	1685342	424823	273973	262	166
10. Malappuram	1856362	242136	173965	130	95
11. Kozhikode	2105249	278421	243405	131	118
12. Cannanore	2265164	414136	372133	175	157

Source: Report on livestock census 1972.

The distribution of cows and buffaloes in milk per 1000 humans in the various districts of the state 1972.

State/ District	Population	No. of cows in milk	No. of cattle per 1000 human population	No. of she- ffaloes in milk	No. of she- buffaloes in milk per 1000 human population	No. of bovines in milk	No. of bo- vines in milk per 1000 human population
1. Kerala State	21247375	606192	28	83188	4	699280	32
2. Trivandrum	2199606	43775	20	11621	5	55205	25
3. Quilon	2412221	76751	32	6762	3	83513	35
4. Alleppey	2125722	81539	39	2919	1	84753	40
5. Kottayam	1533030	53762	35	2707	2	61475	40
6. Idilli	765608	30563	40	3771	5	34339	45
7. Ernakulam	2163674	51113	24	5738	3	56851	27
8. Trichur	2123797	44579	21	11676	5	56255	26
9. Palghat	1685342	36127	39	13316	8	69252	41
10. Malappuram	1856352	50000	20	9492	5	45519	25
11. Kozhikode	2106249	70455	27	6036	3	62716	30
12. Cannanore	2365164	70455	30	8650	4	79106	34

Source: Report on livestock census 1972.

Table No. 25.

The working bovine plough ratio in the state - 1972.
.....

District/ State	No. of ploughs (both wooden & Iron)	No. of working bovine per 1000 plough	No. of working cattle per 1000 plough	No. of working buffaloes per 1000 plough
1. Kerala State	428817	1438	910	528
2. Trivandrum	20543	1343	670	674
3. Quilon	45056	973	767	205
4. Alleppey	19792	869	573	296
5. Kottayam	8521	1724	1504	213
6. Idikki	7511	1743	1520	228
7. Ernakulam	53510	1247	1047	201
8. Trichur	43417	1733	1087	636
9. Palghat	102909	1470	590	880
10. Malappuram	53313	1548	908	640
11. Kozhikode	27608	1619	1202	416
12. Cannanore	47637	1650	1299	352

Source: Report on livestock census 1972.

Table No. 27.

The land (cropped area) plough ratio for the state and districts - 1972.
.....

State/ District	Total crop area in hectares	Total No. of plough	No. of plough per 100 hect. of total cropped area
1. Kerala State	2988356	428817	152
2. Trivandrum	249454	20543	82
3. Quilon	356309	45056	126
4. Alleppey	233167	19792	85
5. Kottayam	366962	10540	29
6. Idikki	..	..	..
7. Ernakulam	284781	53002	204
8. Trichur	245297	43417	177
9. Palghat	337874	102909	305
10. Malappuram	256306	53313	208
11. Kozhikode	270043	27608	102
12. Cannanore	358683	47637	133

Source: Report on livestock census 1972.

Table No. 28.

Average Daily Milk yield per animal in Milk as per the sample Survey conducted in 1964-65 (in kgs.).

Zone	<u>Cattle</u>				<u>Buffaloes</u>			
	winter	summer	Rainy	overall	winter	summer	Rainy	overall
High land	1.480	1.112	0.913	1.150	2.250	2.087	1.662	1.869
Midland	1.020	0.904	1.133	1.018	1.805	1.731	2.267	1.969
Lowland	1.501	1.631	1.044	1.345	2.061	1.300	3.947	3.092
Overall	1.217	1.087	1.073	1.114	1.913	1.774	2.573	2.192

Source: Livestock census report - 1972.

Table No. 29.

The average milk yield per day per goat in milk as estimated from the Sample Survey conducted in 64-65.

Season	Average daily milk yield per goat (in gms.)
Winter	236
Summer	313
Rainy	243
Overall	266

Source: Livestock Census Report - 1972.

Number of animals slaughtered in the licensed slaughter house and meat stalls during the calendar years 1967-1974.

Year	Cattle										Buffaloes	Pigs	Goats	others	Total
	Male	Female	Calves	Male	Female	Calves	sheep	7	8	9						10	11	12
1967	85732	51257	9239	37272	16978	3211	107633	240395	7609	755	56998E				
1968	89322	54372	8354	44007	21004	4243	98754	251976	12096	210	584943				
1969	85324	51433	6361	43910	19399	3159	98011	253026	11086	321	572274				
1970	86163	51812	7567	37825	17830	3455	88163	257115	14289	703	565227				
1971	82345	43590	6238	34827	17505	2810	85135	229287	15173	331	523241				
1972	78046	49864	5315	34722	15037	3323	60620	267215	14055	250	528618				
1973	77303	48801	4192	36255	18902	2450	31969	269768	12022	165	502127				
1974	87128	45425	5269	33312	19725	3352	62055	243405	12733	174	509583				

Source: Department of Animal Husbandry.

Table No.31.

Estimates of output of livestock products other than milk and milk products for the year 1973-74.
.....

Sl.No.	Items	Unit	Estimated quantity
1.	Beef	metric tonnes	11379
2.	Buffaloe meat	do.	7581
3.	Mutton	do.	5852
4.	Pork and other flesh	do.	10199
5.	Bone and horns	do.	2893
6.	Dung	do.	3046534
7.	Hides and skins	numbers	1308800

Source: Bureau of Economics & Statistics,

Table No.32.

Number of Dairy plants and chilling centres in Kerala and their installed capacity and qty. of milk handled through during the years 73-74 & 74-75
.....

Sl.No.	Items	Unit	73-74	74-75
1.	Number of Dairy plants	Nos.	5	6
2.	No.of chilling centres	Nos.	10	12
3.	Capacity of Dairy plants	Litres/day	34000	51000
4.	Capacity of chilling centres	do.	27600	29400
5.	Total qty. of milk handled through Dairy plants	litres	8830689	10768539
6.	do. chilling plants	do.	3303089	3727942
7.	Total production of milk	('000 tonnes)	410	440

Note: The figures include cow milk and buffaloe milk only
Source: Dairy Development Department.

Table No. 20

Food values of various livestock products (in percentage)

Type of product	Calorific value per 100 gms.	Moisture	protein	Fat (Ether extract)	Carbohydra-tes	Mineral matter	Calcium	Phos-phorus	Iron
Cow Milk	65	87.6	3.3	3.6	4.8	0.7	0.12	0.09	0.2
Buffalo milk	117	81.0	4.2	30.3	5.1	0.8	0.21	0.13	0.3
Goat milk	84	85.2	3.7	5.6	4.7	0.8	0.17	0.12	0.3
Human milk	67	88.0	1.0	3.9	7.0	0.1	0.02	0.01	0.2
Curds	51	90.2	2.9	3.0	3.3	0.6	0.12	0.09	0.3
Butter milk	15	97.5	0.8	1.1	0.5	0.1	0.09	0.03	0.8
Skim milk	29	92.1	2.5	0.1	4.6	0.7	0.12	0.09	0.2
Cheese	348	40.3	24.1	25.1	6.3	4.2	0.79	0.52	2.1
Mutton (muscle)	194	71.5	18.5	13.3	..	1.3	0.15	0.15	2.5
Pork (muscle)	114	77.4	18.7	4.4	..	1.0	0.03	0.20	2.3

Sources: Basic facts about cattle wealth and allied matters.

Table No. 34.

Statement showing the No. of Veterinary Institutions in Kerala during
the years 1971-72 to 1973-74.

Sl.No.	Institutions	71-72	72-73	73-74
1.	Veterinary Hospitals	62	60	60
2.	Veterinary Dispensaries	263	293	285
3.	Mobile Veterinary Dispensaries	10	..	10
4.	Veterinary Sub-Centres and first aid centres	123	113	128
5.	Key Village Blocks	18	163	14
6.	Key Village Sub-centres & subsidiary centres	200	..	151
7.	Artificial insemination centres & sub centres	31	30	30
8.	I.C.D. Projects and R.A.I. centres	1	2	8
9.	R.A.I. centres and sub centres	104	167	162
10.	Clinical Labs & Central Veterinary stores	8	8	8
11.	Cross Breeding Schemes	2	..	2
12.	Cross Breeding Sub-Centres	9	10	7
13.	Rinderpest Eradication Scheme	3	..	1
14.	Rinderpest Eradication checkpoints, Vigilance Unit etc.	16	13	19
15.	Pig Development Office	..	..	1
16.	Pig Development Blocks	5	5	5
17.	District Livestock Farms	3	1	1
18.	Dry stock Farm	2	2	2
19.	I.P.D. Blocks/Boiler farms	2	3	3
20.	Regional poultry farms	4	4	4
21.	District Poultry farms	4	3	3
22.	Central Hatchery	1	1	1
23.	Duck farm	1	1	1
24.	Egg collection and marketing schemes	1	1	1
25.	L & P. Feed Factory and feed compounding factory	2	2	2
26.	Bacon factory	1	1	1
27.	Fodder Development and Research Unit	..	..	1
28.	Disease Investigation Offices	..	..	3
29.	Veterinary and Biologic Institute	..	..	1
30.	District Veterinary Offices	..	..	10
	Total	881	898	925

Source: Bulletin of A.H. statistics.

Table No. 25.

Statement showing the details of work turned out in the various Veterinary Institutions of the state during the years 1971-72 to 1973-74.

Year	No. of Veterinary institutions	No. of artificial insemination done	No. of calves born	No. of castrations done	No. of cases under import and categories of diseases treated
1971-72	881	335492	69394	28420	1630793
1972-73	898	543327	110984	39355	1699722
1973-74	925	480964	106531	36395	1707343

Sources: Animal Husbandry Department.

Table No. 26.

The trade movement of cattle from and into Kerala by Road during the years 71-72 to 73-74.

Category	1971-72		1972-73		1973-74	
	Incom- ing	Out- going	Incom- ing	Out- going	Incom- ing	Out- going
1	2	3	4	5	6	7
1. Cattle	359681	11620	356473	11425	385796	8228
Cows in milk, work bullocks slaughter animals and others						
2. Buffaloes	151461	11091	169458	9431	199246	8530
Cows in milk, work bullocks slaughter animals and others						
3. Sheep and goats	30751	7712	12627	3785	..	..
Grand Total	541833	30423	538468	24641	585142	16758

Source: Bulletin of A.H. Statistics.

Table No. 37.

Statement showing trade in livestock, livestock products, cattle feed etc. through road during the years 1971-72 to 73-74.

Commodity	Value of commodities (Rs. in '000)				1973-74 Incom- ing	1973-74 Out- going
	1971-72 Incom- ing	1971-72 Out- going	1972-73 Incom- ing	1972-73 Out- going		
1. Cattle	3186	17	3859	24	1792	..
2. Milk	12	..	14	..	97	..
3. Butter and ghee	58	..	32	..	29	..
4. Hides and skins	2	81182	2	90800	15	94055
5. Oil cake	4543	..	5759	10923	24230	12215
6. Cattle feed	8633	..	8523	1732	10624	1161
7. Cotton seed	3213	33	3322	159	4046	10
8. Straw	685	..	685	89	1026	215
9. Brum	1	..	112	340	402	1541
10. Tamarind seed	NA	NA	7	240	249	..

Source: Board of Revenue (Taxes), Trivandrum.

Statement showing trade in livestock and poultry through rail during the calendar year 1974.

.....

Commodity	Unit	1963		1967		1968		1974	
		Export	Import	Export	Import	Export	Import	Export	Import
1. Livestock	Nos.	218	11247	66	6917	2148	16471	1060	14110
2. Eggs	laks	1776.04	83.86	2007.80	125.31	1529.95	107.23	46023 (Qtl.)	7638 (Qtl.)
3. Rawskin	Qtl.	374	169	358	286	162	1101	NA	NA
4. Raw leather	do.	83	934	8	334	34	1538	NA	NA
5. Bone and Bone meal	do.	5193	87219	755	87677	13283	183741	NA	NA
6. Other livestock products	do.	2356	30518	17134	39874	488	24948	NA	NA

Source: Animal Husbandry Department.

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