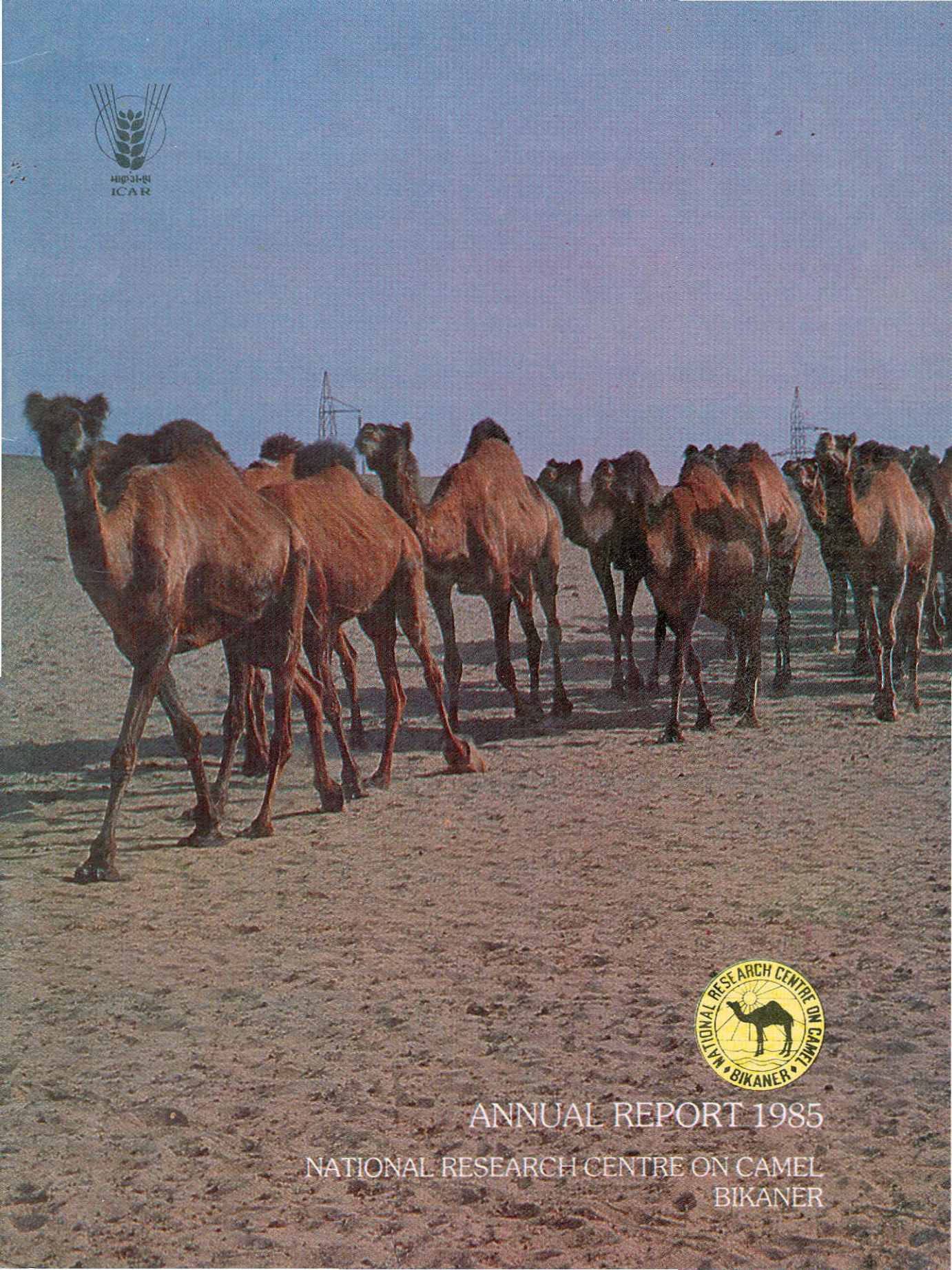

ANNUAL REPORT 1985

NATIONAL RESEARCH CENTRE ON CAMEL
BIKANER

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(Estd. 5th July, 1984)

PROJECT DIRECTOR : DR. N.D. KHANNA

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CONTENTS

1. INTRODUCTION

1.1. Brief Background

The National Research Centre on Camel (N.R.C.C) was approved during the last phase of the VIth Five Year Plan with a total outlay of Rs. 37.00 lakhs. The approval of Government of India for establishing the N.R.C.C. was conveyed vide ICAR Office Order No. F. 28(1)/ 81-AS(C&P), dated March, 1984.

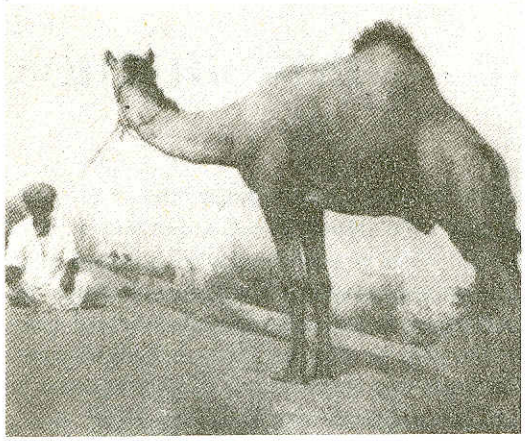
The Centre actually came into existence on 5th July, 1984. The physical facilities available at the erstwhile Camel Breeding Farm consisting of 149 camels of Bikaneri Breed, approx: 2060 acres of forest and grazing land, one open well, Camel sheds and residential complex were transferred by the Animal Husbandry Department of the Government of Rajasthan to the Indian Council of Agricultural Research.

1.2. Justification

The Camel is an important component of the desert eco-system where the flora of usually marginal land can hardly meet the needs of human food and energy. The camel is known as 'the ship of desert' traversing long distances on sandy stretches carrying men and material. It is also of great importance for defence and civil law and order in the border desertic areas. In Rajasthan and Gujarat, the camel is a symbol of Pastoral Societies inhabitating desert areas. It is important that potential of the camel becomes known, because as pastoral societies disappear and camel owners become sedentary, so also disappears the camel. This is a dangerous trend as an animal production system adopted to an eco-geological system has to be substituted by something that may be less efficient and more vulnerable to different types of disturbances. Considering importance of this species in the development of arid and semi-arid zones, the Indian Council of Agricultural Research (ICAR) has established a National Research Centre on Camel (NRCC) at Jorbeer, Bikaner (Rajasthan) on 5th July, 1984.

Camel belongs to the family *Camelidae* in the ruminant suborder Tylopoda of the order *Artiodactyla* (even toed ungulates). In the New World, *Camelidae* is represented by two wild species in the High Andes. The vicuna *(Vicugna vicugna)* is now very rare and is restricted to the highlands of Peru and Bolivia. The guanaco*(Lama guanacoe)* has now discontinuous distribution from Bolivia to Tierradel puego. From it, two domestic animals, i.e. the Llama and Alpaca, have developed. In the old world, there are two types of camels, namely, the one humped *(Camelus dromedarius)* and two humped *(Camelus bactrianus)*. The Indian Camels falls in the former category.

As per F.A.O. Production Year Book (1983), The world population of camel was around 16.95 million, of these about 16.75 million were present in the developing countries while only 0.20 million were present in the developed countries.



Single Humped

Double Humped

Out of the total camel world population, approx: 15.5 million were dromederians and 1.5 million were bactrians. Amongst countries having camels, India possess quite large number. These are mostly found in Rajasthan, Haryana and Gujarat. A fairly good number is also found in Utter Pradesh, Punjab and Madhya Pradesh. According to the 1983 livestock census figures, the camel population of the country was around 1.05 million, of which about 0.75 million i.e. 70% of the total Indian Camel populaton were found in the Rajasthan State alone. These statistics clearly reflect the importance of camel in the rural economy of dersert/semi-desert areas, particularly of Rajasthan.

The Indian Camels can be broadly classified into baggage camel and riding camel. The baggage camels are sturdy and heavy built while the riding camels are more delicate, fine and lighter in conformation. The North Western arid and semi-arid regions comprising of Great Indian (Thar) desert, parts of Rajasthan, Haryana and Gujarat States have almost the entire population of the baggage and riding camels of the country. The tolerance to adverse physical environmental conditions in the arid zone, e.g., high temperature, high solar radiation, water deprivation, poor vegetation resulting in starvation for days, have made camel an animal of extreme utility. It is ideally suited for riding and transportation of material as well as for agricultural operations viz., ploughing, water carrying, and threshing. There exists a camel corps in the Border Security Force of the Government of India.

In addition to the source of animal draft, the camel is also used in some countries as a good source of milk, meat, hair and hide. However, in India, it is mostly used as beast of burden.

Looking to the importance of camel, it was felt necessary to intensify Scientific research on the Indian Camels. The areas of behaviour, physiology, reproduction, anatomy, breeding, nutrition, disease control and socio-economic importance of camels are required to be studied thoroughly. To study these aspects, the Indian Council of Agricultural Research provided financial support to establish a Camel Breeding Farm at Bikaner, in the year 1957. This project envisaged establishment of 10 breeding centres which were to operate on the pattern of all India Key Village Schemes. The object was to collect scientific data on the camel and to undertake steps to improve the breeds of camel by selective breeding. How-

ever, the proposed objectives were not fully achieved. All the same, some very useful work especially on anatomy, nutrition, diseases and physiology etc.; were carried out at the Veterinary College, Bikaner. Further, a number of research projects on camels are also in progress at the Haryana Agricultural University, Hissar and Gujarat Agricultural University, Banskanta, Dantiwada.

1.3 Objectives

Considering the importance of camel in the arid and semi-arid zones and realising that this important species of domestic animals needs through search for its potentials so that camels can be made still more useful to optimize its productivity and working capacity, the National Research Centre on Camel has been established to undertake research on various aspects to improve draughtability of Indian Camels. For the purpose of fulfilling these objectives, the following major research programmes will be undertaken:–

1. Establish the work standards for riding and baggage camels.
2. Study and associate the work standards with physical, physiological and biochemical parameters.
3. Develop suitable selection criterion on the basis of the established standards for improvement of working capacity.
4. Develop suitable management practices for rearing camels.

2
INFRASTRUCTURAL FACILITIES

2.1. During the period under report, action was taken to establish laboratory facilities at the Centre. For this purpose, the old building was renovated and repaired. An annexe laboratory room was also added. Common use equipments, glasswares, chemicals etc., were procured.

2.2. Barbed wire fencing was constructed around the livestock farm area. All the old camel sheds were repaired and two new camel baras were constructed. One old camel shed was converted into 10 camel boxes with G.I. pipe railings for housing camel studs. One fodder godown, one postmortem platform, two garages, a shed for keeping camel carts etc., and a camel dispensary were constructed in the livestock farm area. All the available residential quarters are also under repair and renovation.

3
LAND AND FODDER DEVELOPMENT

3.1 About 2060 acres of forest land surrounded by ranges of sand dunes was transferred to the NRCC. The area was unmarked, barren and devoid of any development.

Only one open well was available at the livestock farm area, which was sufficient only for the requirement of livestock and animal attendants. One more tube well was got constructed in farm area with an output of 8000 gallons per hour rating. Necessary action to construct pump house, to procure motor & pump and for the electric supply line was taken-up. It is expected that the well will start functioning soon.

3.2 About 40 hectares of land was developed for cultivation of fodder crops. The fencing of areas with barbed wire as well-as improvised fencing using thorns and trenches was initiated in a phased manner so that area could be demarcated. For protection of crops and soil from winds, grasses & trees are being planted to develop shelter belts and wind breakers.

3.3 Action was taken for range land management and for developing farm layout. Since for years, this area was completely neglected, there were problems of uncontrolled grazing and depleting grazing resources. Steps were taken for construction of farm approach roads and fencing. The demarcation of land was got done taking assistance of concerned local authorities.

3.4 Cultivation of rain fed crops viz., Guar, and Moth were sown in about 20 hectares of land after necessary land preparation. Only a small area of about 0.15 hectares could be put under irrigated cropping for green fodder owing to great scarcity of water.

Collection of top feeds in the area viz.,pala, zal and phog were also done. About 5900 plants of various species were planted but due to rain failure and extreme draught conditions, the results were not very encouraging.

4
LIVESTOCK

4.1. Strength

The total number of camels as on 31.12.1985 were 158. Out of which 60 were males and 98 females. The detailed break-up of animals, age wise and sex wise is provided in table-1.

4.2 Breeding and Management

4.2.1. Out of 71 breedable females, there

TABLE – 1

HERD STRENGTH (AGE GROUP & SEX WISE) 31ST DECEMBER, 1985

Sl. No.	Age Groups	Number of animals		
		Male	Female	Total Animals
1.	0-6 Months	6	9	15
2.	6-12 Months	14	3	17
3.	1-2 Years	9	9	18
4.	2-3 "	9	6	15
5.	3-4 "	8	3	11
6.	4-5 "	2	7	9
7.	5-6 "	3	9	12
8.	6-7 "	1	5	6
9.	7-8 "	5	10	15
10.	8-9 "	1	4	5
11.	9-10 "	-	4	4
12.	10-11 "	-	2	2
13.	11-12 "	-	3	3
14.	12-13 "	-	8	8
15.	13-14 "	-	1	1
16.	14-15 "	-	-	-
17.	15-16 "	-	4	4
18.	16-17 "	-	4	4
19.	17-18 "	2	3	5
20.	18-19 "	-	2	2
21.	19-20 "	-	1	1
22.	20-21 "	-	-	-
23.	21-22 "	-	-	-
24.	22-23 "	-	-	-
25.	23-24 "	-	-	-
26.	24-25 "	-	1	1
		60	98	158

were 46 pregnant, 9 dry and 16 with calves as on 31.12.1985 (Table-2).

32 calves were born during the period, out of which there were 20 males and 12 females, which comes to 62.5% males and 37.5% females. The details of calves born month wise are provided in table-3.

TABLE – 2

NO. OF BREEDABLE SHE-CAMELS AS ON 31ST DECEMBER, 1985

Total Breedable She Camels	Milking	Pregnant	Dry
71	16	46	9

TABLE - 3

NUMBER OF CAMEL CALVES BORN (MALE AND FEMALE) 1.1.1985 TO 31.12.1985

Total calves Born			Jan. 85		Feb. 85		Mar. 85		Apr. 85		Oct. 85		Nov. 85		Dec. 85		Sex Ratio
M	F	Total	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M : F
20	12	32	7	0	5	1	1	0	1	2	1	0	0	1	5	8	62.5 : 37.5

Table 4 provides information on services given and number of services required per conception. In all 47 animals were served with natural service during the period under report for which 78 services were required.

Failure of Pregnancy was noticed in 3 females after about 3 months. Four animals aborted during the period and four premature/still births were recorded (Table-5).

The table-6 provides the number of animals from farm and outside who were given service

TABLE – 4

NUMBER OF SERVICE PER CONCEPTION (1ST JAN. 85 TO 31ST DEC. 1985)

No. of Animals served	No. of Services provided	No. of Animals pregnant	Average No. of services required per conception
47	78	39	2.0

TABLE – 5

ABORTION AND STILL BIRTH (1ST JAN. 85 TO 31ST DEC. 85)

S.No.	Abortion (Brand nos.)	Still Birth (Brand nos.)	Age groups	Date
1.	—	994	8 – 9 Years	20.01.85
2.	—	1089	4 – 5 Years	20.01.85
3.	—	1044	6 – 7 Years	25.02.85
4.	595	—	17 – 18 Years	29.07.85
5.	1033	—	7 – 8 Years	01.08.85
6.	981	—	9 – 10 Years	11.08.85
7.	1067	—	6 – 7 Years	15.08.85
8.	—	946	9 – 10 Years	30.11.85
Total	4	4		

during the period. In all, 214 animals were given service, of these, 167 animals were from outside (Table-6)

TABLE – 6
NUMBER OF ANIMALS PROVIDED SERVICE OF CAMEL STUDS
(01.01.1985 to 31.12.1985)

Total No. of Animals served	Farm	Outside
214	47	167

The young calves were weaned during the month of October, 1985 so that females could be ready for next breeding season.

The table-7 provides average weights age group wise, as on 5th July, 1984 when the farm was taken over and the same information as on 31.12.1985. The average increase in body weight in all age groups varied from 83.20 kg. to 182.50 kg.

The average daily weight gain in camels in different age groups during the year, is presented in table-8.

It may be seen from the table-8, the average daily weight gain ranged from 333 gms. to 720 gms. The daily weight gain from 6 months to 1 year was at the rate of 437 gms. per day, from 1 year to 2 years was 472 gms., from 2 years to 3 years was 461 gms; and from 3 years to 4 years 497 gms. In the later age groups the weight gain due to pregnancy is also included.

Post-natal growth rate of young camel calves during the year is presented in table-9.

The growth rate in male calves during first twelve months was slightly higher than the female calves. (figure No. 1)

12 males were supplied to the Animal Husbandry Department, Government of Rajasthan, for distribution amongst Panchayat Samities for breed improvement in the near about area. There was great demand amongst the panchayat Samities for NRCC breed animals.

Free camel stud services were also provided at the farm premises to the farmers and camel owners who brought their she-camels. The copulation time in camel was observed to

TABLE – 8
BODY WEIGHT GAIN PER DAY (AGE GROUP WISE) FROM 1.1.85 to 31.12.1985

Sl. No.	Age Groups	No. of Observation	Average Daily Wt. in Gms. (gain)	Remarks
1.	6 – 12 Months	17	437 gms.	
2.	1 – 2 Years	18	472 gms.	
3.	2 – 3 Years	15	461 gms.	
4.	3 – 4 Years	11	497 gms.	
5.	4 – 5 years	9	645 gms.	
6.	5 – 6 Years	12	552 gms.	
7.	6 – 7 Years	6	472 gms.	
8.	7 – 8 Years	15	720 gms.	
9.	8 – 9 Years	5	473 gms.	(Includes gain due to
10.	9 – 10 Years	4	407 gms.	pregnancy also.)
11.	above 10 Years	31	333 gms.	

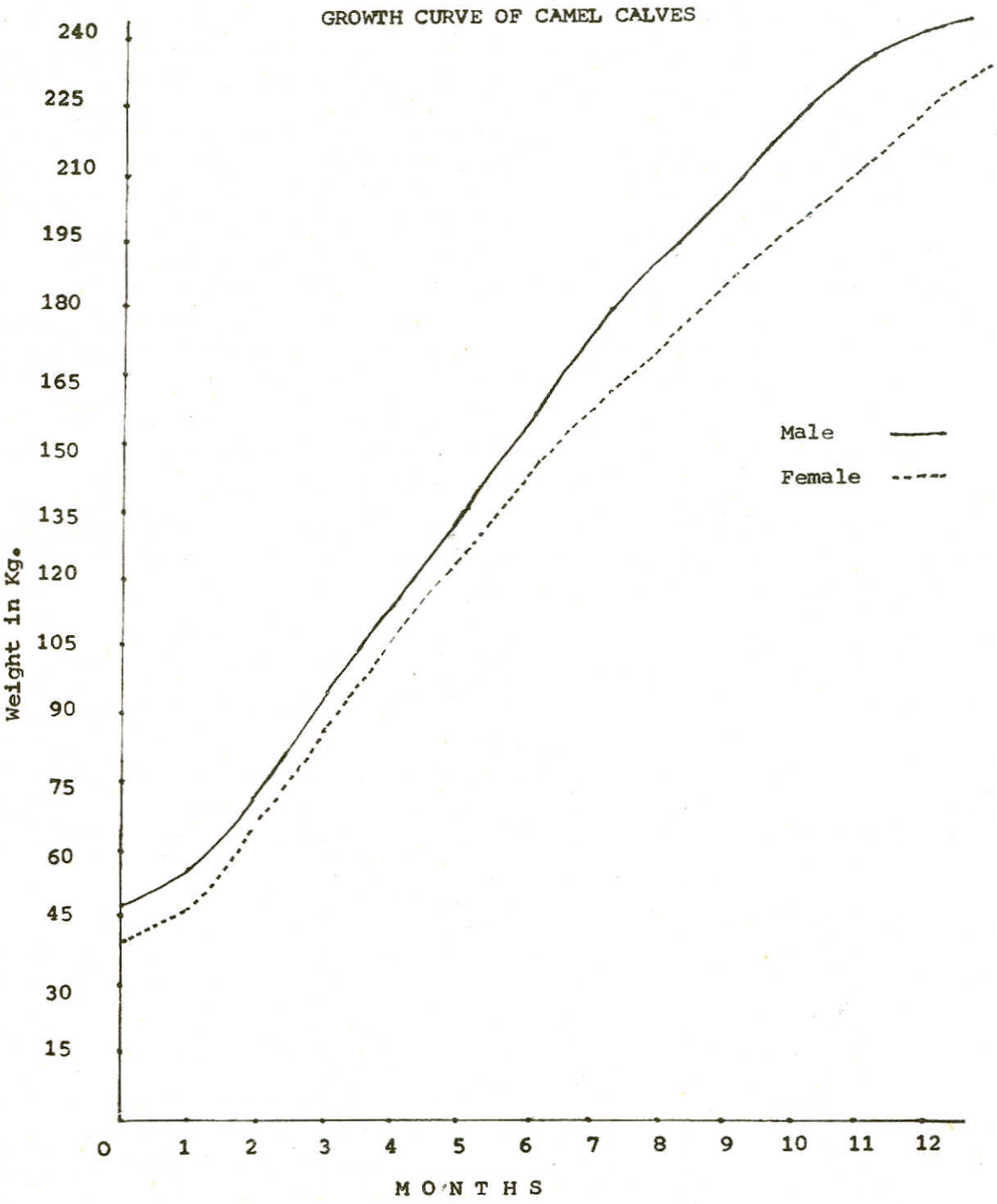

GROWTH CURVE OF CAMEL CALVES
240
225
210
195
180
165
150
135
120
105
90
75
60
45
30
15
Weight in Kg.
Male
Female
0
1
2
3
4
5
6
7
8
9
10
11
12
M O N T H S

TABLE – 7
AVERAGE BODY WEIGHT (AGE GROUP WISE) 5.7.84 to 31.12.1985

Age groups	No. of observation	Average weight on 5.7. 84	No. of observation	Average weight on 31.12.84	No. of observation	Average weight on 31.12.85	Body weight gain in age groups in 1½ Years
0 – 6 Months	—	—	7	40.0 Kg	15	43.4	–
6 – 12 Months	19	114.4	18	193.8 Kg	17	224.6	+110.20
1 – 2 Years	19	191.4	15	264.7 Kg	18	294.4	+108.00
2 – 3 Years	13	249.0	11	313.6 Kg	15	403.1	+154.10
3 – 4 Years	14	294.8	14	367.7 Kg	11	462.4	+167.60
4 – 5 Years	15	411.2	15	421.4 Kg	9	536.4	+125.20
5 – 6 Years	8	440.0	8	536.7 Kg	12	577.0	+137.00
6 – 7 Years	14	493.0	13	584.9 Kg	6	629.3	+136.30
7 – 8 Years	6	539.3	6	671.0 Kg	15	693.7	+154.40
8 – 9 Years	6	552.6	4	661.0 Kg	5	635.8	+ 83.20
9 – 10 Years	2	579.0	2	618.2 Kg	4	761.5	+182.50
above 10 Years	33	587.1	33	670.0 Kg	31	679.9	+ 92.80
	149		146		158		

TABLE – 9
POSTNATAL GROWTH RATE OF YOUNG CAMEL CALVES

	Body weight birth – 12 months age (in kg).												
	Birth Weight	1	2	3	4	5	6	7	8	9	10	11	12
Average Weight Male Calves	47.17	54.06	70.73	93.33	113.73	134.80	154.93	177.14	189.00	201.21	217.85	230.00	233.11
Average Weight Female Calves	39.00	46.80	64.80	85.50	107.00	124.50	142.50	159.50	170.00	191.33	195.00	208.00	221.00
Average Weight Pooled	44.65	52.33	69.25	91.68	112.32	132.63	152.17	173.22	184.78	199.74	214.80	227.07	230.91

range between 2 minutes to 18 minutes with an average of 6.30 minutes. this information is based on 252 observations (table-10).

TABLE – 10
COPULATION TIME

Total number of observation	Range	Average
252	2-18 minutes	6.30 minutes

4.2.2. For conducting Breeding and Genetics studies in camels, the available data of previous years were collected on different production, reproduction and other parameters affecting calvings. A project on investigations on different parameters affecfting calvings in camels is in progress.

Data on 904 births recorded during 1961-85 were collected. Out of 904 births, the sex ratio observed was 484 males and 420 females. The calvings occured only during the months of January to May and October to December every year. It may be seen from Table-11 that maximum calvings occurred during the month of January followed by February, March, December, April, May, November and October in descending order.

4.2.3. Studies on age at first calving, gestation period and birth weight:–

Data on gestation period, age at first calving, age at first service and birth weight were collected and the analysis is under progress. A total of about 532 calvings are being analysed. The

TABLE – 11
MONTH WISE & SEX WISE CALVINGS IN CAMELS (1961-85)

Sl. No.	Month	No. of Male calves	No. of Female calves	Total
1.	January	159	135	294
2.	February	154	122	276
3.	March	78	61	139
4.	April	24	23	47
5.	May	7	4	11
6.	October	1	2	3
7.	November	4	3	7
8.	December	57	70	127

average gestation period for the female calves was 388.598 days while for the male calves 389.875 days.

The difference in the gestation period of calves between two sexes was statistically non-significant (table-12).

The average birth weight of new born calves was 47.00 kg. for males and 39.12 kg. for females during the year 1985 (table-13).

TABLE – 13
BIRTH WEIGHT DURING THE YEAR 1985

No. of Births	Male calves	Female calves
32	47.00 Kg. (20)	39.12 Kg. (12)

TABLE – 12
GESTATION PERIOD IN CAMELS (in days)

Total number of observations	Period	Average for Male calvings	Average for Female calvings
532	1961 – 1980	389.875(281)	388.598(251)

Note: The figure in parantheses indicates number of observations in tables 12 and 13.

Statistical analysis to investigate different factors affecting production parameters and their correlation is under progress. The age at first calvings in camels was observed to be 1882.38 days and average age at first service was found to be 1387.14 days (table-14).

Facilities were provided to a Ph.D. Scholar for Haematological studies initiated in five different age groups to find out effect of age, sex and season on these parameters. Four biochemical parameters will be studied along with ten haematological parameters, namely, haemoglobin, RBC, WBC Erythrocyte Sedimentation rate, platelet count, MCH, MCV, MCHC and packed cell volume in different seasons and different age groups. The detailed results will be notified in the next report as the work is in progress. However, preliminary report on some biochemical parameters is given in table-15.

4.2.4. Twenty she-camels were selected at random in two groups amongst those in lactating stage and non- lactating stage with a view to conduct udder measurements in the Bikaneri She-camels. For this purpose, measurements were taken on circumference of udder, length of teats and distance between fore teats and hind teats. The details are provided in table-16.

4.2.5. Recording of different body measurements in different age groups in different sexes has been initiated to conduct genetical studies on the growth rate, body weights and body measurements, their inter reltionships in the two sexes and the effect of season. For this purpose seven measurements, namely, Length of limbs, Girth, Height at hump. Necklength, Distance between fore legs, Face length and Tail length in 62 animals of different age groups and two sexes were recorded. preliminary results are presented in table-17.

4.2.6. Studies in collabortion with Haryana Agricultural University on hormonal status in breeding and non-breeding seasons in the camels is in progress. Blood samples from 10 male calves of varying age groups were collected during rutting and non-rutting seasons. Sera were analysed for thyroxine (T-4) and triiodothyroxine (T-3). In general thyroid level in camels was higher than other animals. The T-4 : T-3 ratio was just double during rutting season. The effect of age on these hormones was not noticed.

4.3 Health

4.3.1. During the period under report 235 clinical cases were treated, of these, 62.97% for general diseases and 37.03% for minor surgical ailments and others.

4.3.2. Prophylactic treatment against internal parasites ecto-parasites and Trypanosomiasis was given to the animals. Out of animals screened for internal parasites, about 57.8% animals were found to be positive for single or mixed infestation of internal parasites. The common parasites noticed were trichuris, strongyles, haemonchus and balanti-

TABLE – 14

AGE AT FIRST SERVICE AND AGE AT FIRST CALVING

Total number of observation	Average age at first service (in days)	Total No. of observation	Average age at first calving (in days)
60	1387.14	93	1882.38

TABLE – 15

SHOWING LEVEL OF BIOCHEMICAL CONSTITUENTS

Sl. No.	Age groups	No. of animals	Protein gm/dl	Glucose mg/100 ml	Uric Acid mg/ 100 ml	Cholesterol mg/ 100 ml.
1.	6 months – 1 year	6	7.477	102.127	0.482	25.333
2.	1 – 2 years	6	7.415	103.407	0.455	34.833
3.	2 – 3 years	6	8.010	104.380	0.510	41.333
4.	3 – 4 years	3	8.759	104.260	0.533	30.333
5.	Above 4 years	6	7.835	92.980	0.498	49.667

TABLE – 16

UDDER MEASUREMENTS IN LACTATING AND NON-LACTATING SHE-CAMELS (IN CM.)

Sl. No.	Status of She-camel	Number animals	Circum ference	Length of teat				Distance between right and left teats		Distance between fore and hind teats	
				Rt. fore	Rt. hind	Lt. fore	Lt. hind	Anterior side	Posterior side	Right side	Left side
1.	Lactating	20	94.90	4.25	3.82	4.35	3.65	20.45	18.70	6.77	6.67
2.	Non-Lac tating	20	53.30	3.80	2.87	3.75	2.82	13.12	12.17	5.15	5.37

TABLE – 17

AVERAGE GAIN IN SIX MONTHS PERIOD (JULY TO DECEMBER 1985) IN DIFFERENT BIOMETRICAL MEASUREMENTS (in Cm.)

Measurements	Age group 0 – 1 year			Age group 1 – 2 years			Age group 2 – 3 years			Age group 3 – 4 years		
	Number of observation	Initial measurement	Average gain	Number of observation	Initial measurement	Average gain	Number of observation	Initial measurement	Average gain	Number of observation	Initial measurement	Average gain
1. Length of limbs	17	116.29	2.2	18	129.78	2.1	15	139.00	1.5	11	144.45	1.3
2. Girth	17	136.82	12.2	18	164.67	5.9	15	182.87	4.3	11	192.27	6.3
3. Height at Hump	[illegible]	19.5	[illegible]	18	24.6[illegible]	6.3	[illegible]	30.40	...	[illegible]	34.[illegible]	5.7
4. Neck Length	17	83.65	1.6	18	95.89	1.6	15	103.93	1.2	11	111.27	1.0
5. Distance between eyes	17	23.82	1.0	18	24.22	0.6	15	26.47	0.9	11	28.00	0.6
6. Face Length	17	29.76	2.4	18	35.50	1.4	15	39.53	1.0	11	41.09	0.9
7. Tail Length	17	46.53	2.5	18	51.78	1.8	15	54.27	1.4	11	56.55	1.1

dium. After first dosing the percentage of positive faecal samples came down to 21%. After second dose, however, all the animals became apparently negative. Proper insecticide treatment was given to the animals to control ecto-parasites. Sheds/baras were also sprayed with the insecticides.

Pre-natal and post-natal care to the new born calves and proper health coverage to the dams was provided during calving season.

4.3.3. Data on the causes of mortality from 1960-1985 were collected. Out of available data on 256 deaths, it was observed that 30% deaths occurred due to diseases of respiratory systems, 30% due to diseases of digestive system and 13% due to other miscellaneous causes. The average overall mortality percentage over last 20 years was about 5.5%.

The mortality risks per 1000 camel days per day during last ten years at the farm was also worked out. For this purpose, the data were classified into three groups, namely, calves 0-3 months, 3 months to 3 years and animals above three years.

The animals were further classified according to sex. The results are presented in table-18.

It may be seen from the table-18 that overall pooled mortality risk at the farm during last ten years was 0.1695 per 1000 camel days per day.

The mortality risk during the year 1985 was also worked-out. It was observed that mortality risks per 1000 camel days per day during the period under report was only 0.167 (table-19).

TABLE – 19
MORTALITY RISK DURING 1985

No. of Camel days	No. of animals died	Mortality per 1000 camel days per day.
53850	9	0.167

4.3.4. Data and samples were provided to two P.G. students of college of Veterinary and Animal Science, Bikaner. The results obtained were as under:–

(1) Seroprevalence of coxiellosis (Q-fever) in camels: Out of 140 animals tested, seroprevalence of antibodies was recorded in about

TABLE – 18
MORTALITY IN CAMELS (1975-1985)

Sl.No.	Age Groups	Sex	Camel days	No. of Death	Mortality per 1000 camel days
1.	0 - 3 months	Male	11494	19	1.6530
		Female	10373	12	1.1568
2.	3 months-3 Years	Male	121659	26	0.2137
		Female	111661	16	0.1433
3.	Adult	Male & Female	370353	33	0.0891
	Pooled		625540	106	0.1695

10% animals (these included some animals from outside also). Age wise incidence of seroprevalance of antibodies was more in animals below 10 years as compared to animals of higher age groups.

(2) Bacterial and fungal flora of nasal and vaginal passage were investigated. The generic status of 39 bacterial isolates were micrococcus (14), Staphylococcus (9), Bacillus (14), Neisseria (11) and Escherichia (1). These isolates were further characterised for species. The 39 bacterial isolates of the vaginal passage showed Micrococcus (7), Staphylococcus (8), Streptococcus (1), Bacillus (13), Neisseria (1) Escherichia (3) Aeromonas (2) and Proteus (4).

In the fungal culture of the nasal passage, Aspergillus, Rhizopus, trichocladium, Fusarium, Mucor, Curvularia, Drechlera, Altemaria and Sigmoideomyces were identified. In the vaginal secretions of the camels, Aspergillus, Rhizopus, Alternaria and trichlocladium were identified.

5
INTER INSTITUTIONAL COLLABORATION

Data and samples were provided to two P.G. students of College of Veterinary and Animal Science, Bikaner. One student collected material for investigations on Q-fever, and the other carried out investigations on various pathogenic micro-organisms in the nasal and vaginal secretions of camels. Blood samples were also provided to the Haryana Agricultural University for studies on hormones in camels during various stages of reproductive cycle. One Ph.D. Scholar from the Rajasthan University was provided facilities for undertaking research work on seasonal variation in certain haematological parameters in camels.

6
SPORTS AND EXTRA CURRICULAR ACTIVITIES

Inspite of the fact that there was very limited staff and resources available with the centre in its initial stage of establishment, full opportunities were provided for sports and extra curricular activities. Games and get togethers of the staff were organised on the Republic day and other occasions. The Centre also participated in different events in the zonal Sports Meet held at Karnal.

7
STAFF POSITION

The N.R.C.C. was approved with a limited staff component. The details of staff in various categories during 1985 is given below:–

S.No.	Designation	Name	Remarks
SCIENTIFIC			
(1)	Project Director	Dr. N.D. Khanna	
(2)	Scientist S-2 (Animal Health)	—	Vacant
(3)	Scientist S-2 (Animal Physiology)	—	Vacant
(4)	Scientist S-1 (AG&B)	Dr. S.N. Tandon	25.2.198 [illegible]***
TECHNICAL			
(5)	Farm Manager (T-6)	Sh. R.D. Prasad	30.4.1985***
(6)	Vet. Officer (T-6)	Dr. U.K. Bissa	28.6.1985***
(7)	T-2 (Livestock)	Two posts	Filled
SUPPORTING			
(8)	S.S.G.-1	Eleven posts	Filled
AUXILIARY			
(9)	Driver	Two posts	Filled
ADMINISTRATIVE			
(10)	Administrative Officer,	Sh. Nand Kishore*	
(11)	Asst. Accounts Officer	Sh. G.R. Bhansali	
(12)	Asstt. admin. Officer	—	Vacant**
(13)	Superintendent	Shri Santokh Singh	
(14)	Jr. Stenographer	One Post	Filled
(15)	Sr. Clerk	One post	Vacant
(16)	Jr. Clerk	One Post	Filled

* On temporary transfer from I.V.R.I., Izatnagar alongwith post.

** Since no application was received for A.A.O's post, one Superintendent has been taken on deputation for a year in place of Asstt. Admin. Officer.

*** Date of joining at N.R.C.C. Bikaner

8
FINANCIAL STATEMENT

The details of budget alloted and expenditure incurred during 1984-85 and 1985-86 (up to 31.12.1985) is presented in table-20.

9
VISITORS

During the period under report about 2854 visitors visited NRCC, Bikaner. These included the Hon'ble Minister of State (Animal Husbandry) Rajasthan, high ranking Military Officers, prominent citizens, Scientists, Professors, Administrators/General visitors and tourists.

10
ACKNOWLEDGEMENTS

The advise and guidance of Dr. R.M. Acharya, Deputy Director General (Animal Science), I.C.A.R., Krishi Bhavan, New Delhi, on different matters related to the Scientific, Technical and Administrative, during the initial stage of establishment of the National Research Centre on Camel, Bikaner, is gratefully acknowledged.

TABLE – 20
STATEMENT OF BUDGET AND EXPENDITURE

(Rs. in lakhs)

Sl. No.	Head of account	PLAN(1984–85)		NON-PLAN (85-86)*		PLAN (85-86)*	
		BDGT.EST.	EXPEND.	BDGT. EST.	EXPEND.	BDGT.EST.	EXPEND.
1.	Pay and Allowances	3.86	1.25	3.15	2.45	1.98	0.56
2.	Travelling allowances	0.15	0.11	0.20	0.13	0.10	0.05
3.	Recurring Contigencies	10.00	7.27	5.50	4.80	2.92	2.26
4.	Non-recurring contigencies	6.77	6.94	0.95	0.79	5.00	3.80
5.	Works (Major)	16.00	15.87	—	–	10.00	2.88
6.	Works (Petty & Maint.)	—	5.25	—	—	—	—
7.	Rectt. Expenditure	—	0.10	—	—	—	—
		36.78	36.79	9.80	8.17	20.00	9.55

* Upto 31.12.85.

NATIONAL RESEARCH CENTRE ON CAMEL

The National Research Centre on Camel is located in the Jorbeer area at a distance of about 10 kms. from Bikaner City. The area is arid undulating desert with vast ranges of sand dunes. The soil is mostly loose and sandy. The Bikaner city is spread in 18 sq. km. area with approximately 0.3 million population. The climate is dry with 58-60 average yearly humidity. The average yearly rain-fall is around 26.4 cm. The temperature varies from 2° to 45°c during the year. The geographical location of the area is 28.3° North latitude and 73.5° east longitude at MSL of 234.84 m.

TELEGRAM	:	CAMCENTRE, BIKANER.
TELEPHONE	:	OFFICE : 5489 FARM : 5683
POSTAL ADDRESS	:	NATIONAL RESEARCH CENTRE ON CAMEL JORBEER, P.O. SHIVBARI, BIKANER : 334 001 (RAJASTHAN).
PROJECT DIRECTOR	:	DR. N.D. KHANNA.

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