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**DEPARTMENT OF  
ANIMAL REPRODUCTION**



**RESEARCH ABSTRACTS**



**COLLEGE OF VETERINARY AND ANIMAL SCIENCES  
KERALA AGRICULTURAL UNIVERSITY  
MANNUTHY, TRICHUR**

## RESEARCH ABSTRACTS

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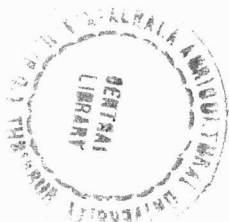
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Late Dr. C. K. S. V. RAJA

## PREFACE

The subject of Obstetrics and Gynaecology was taught to the graduate students until 1961 by the staff manning the ICAR sponsored Cattle Sterility Scheme. Realising the importance of the subject in the Veterinary curriculum, an independent department of Obstetrics and Gynaecology was formed in 1961. This department in the erstwhile Kerala Veterinary College and Research Institute started offering post-graduate course leading to M.Sc. (Vet. Sci.) / M.V.Sc. from 1967. Doctorate programme in the subject of Animal Reproduction was started from 1984. The department has produced so far 34 postgraduates and 12 postgraduate diploma holders and has to its credit 134 research publications.

From the very inception of this department, until his untimely demise in 1982 Dr. C. K. S. V. Raja was heading the Department. Under his dynamic leadership it grew to greater heights. The inspirations received from Dr. Raja's leadership still continues to be the guiding spirit behind the continued growth of this department. We, the members of the Department of Animal Reproduction remember him with gratitude and reverence and wish to dedicate this booklet containing the compendium of the research work carried out in this Department to him.

Mannuthy  
1-8-1988

Dr. K. PRABHAKARAN NAIR  
Professor

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## Summary of Research Articles

Published from the Department of Animal Reproduction

### 1 INVESTIGATIONS ON BRUCELLOSIS IN KERALA.

Raja, C. K. S. V; Neelakantan, C. P. and Nair, D. V. P.

*Indian vet. J.*, (1959) **36**, 537-539

Prevalence of Brucellosis in a privately managed farm in Trichur District was investigated. Out of seven animals one cow which aborted twice was found positive for Brucellosis on serum agglutination test. The herd bull and another heifer gave suspicious titres.

### 2 A CASE OF INFERTILITY IN A BULL

Raja, C. K. S. V. and Nair, D. V. P.

*Indian vet. J.*, (1961) **38**, 118-123

Studies carried out with the semen samples collected from an apparently normal Sindhi bull which had shown a decreased fertility rate during 1957-59 were reported.

### 3 SECONDARY SEX RATIO IN CALVES BORN BY A. I.

Raja, C. K. S. V. and Nambiar, K. G.

*Kerala vet.*, (1962) **1**, 43-45

The data pertaining to 3872 normal birth in the country cows bred by A. I. at the key Village Centre, Ollukara were assembled and analysed. It was observed that out of 3872 calves born by A. I. male and female calves numbered 1964 and 1908 respectively giving a sex ratio of 102.9:100.

### 4 ENVIRONMENTAL FACTORS AFFECTING BIRTH WEIGHT IN MURRAH BUFFALOES

Nambiar, K. G. and Raja, C. K. S. V.

*Kerala vet.*, (1962) **1**, 35-41

A study on the effects of sex of calf, month of calving and sequence of calving on birth weight of buffalo calves

was made by analysing the data relating to 199 birth weights. The average weight at birth was  $71.97 \pm 0.76$  lbs. The male calves were found to weigh more than female calves. The sex of the calf and sequence of calving were found to cause variations in birth weight. Month of calving did not influence birth weight.

#### 5 INFERTILITY IN A BULL DUE TO SPERMS WITH ABAXIAL ATTACHMENT OF HEAD AND MIDDLE PIECE

Raja, C. K. S. V. and Nambiar, K. G.

*Indian vet. J.*, (1962) 39, 541-544

Examination of semen samples collected from a Sindhi bull maintained at the Livestock farm attached to Kerala Veterinary College showed the presence of very large percentage of abnormal sperms with abaxial attachment of head and middle piece, rendering the animal completely sterile. The studies carried out on the bull were reported.

#### 6 INFLUENCE OF SEX OF CALF, MONTH OF CALVING AND SEQUENCE OF CALVING ON GESTATION PERIOD IN MURRAH BUFFALOE/COWS

Nambiar, K. G. and Raja, C. K. S. V

*Kerala vet.*, (1962) 1, 75-83

The month of freshening and sex of calf had no significant effect on the gestation length. Sequence of calving was found to influence the gestation period. There was highly significant positive correlation between gestation period and birth weight of the calf.

#### 7 AZOOSPERMIA IN A BREEDING BULL

Raja C. K. S. V

*Kerala vet.*, (1962) 1, 107-109

A case of testicular degeneration was suspected in a bull which had been consistently showing a conspicuous reduction of sperms in semen. The bull was found to be healthy and normal with well developed secondary sex characters and serving ability. Various treatments were adopted with no favourable response in semen quality in respect of sperms. The case was finally diagnosed as one of extensive testicular degeneration.

**8 CO-EXISTENCE OF MALE AND FEMALE CHARACTERS  
IN A STERILE NULLIPAROUS GOAT**

Lucy Paily and Raja, C. K. S. V.

*Kerala vet.*, (1964) 3, 29-31

An unusual case of lactation in a sterile nulliparous goat associated with masculine features was reported and the possible role of sex hormones involved in the phenomenon was briefly indicated.

**9 STUDIES ON THE SEMEN CHARACTERISTICS OF  
MALABARI BUCKS.**

Kurian, N. I. and Raja, C. K. S. V.

*Kerala vet.*, (1965) 4, 131-133

Observations made on the semen characteristics of 47 samples collected from seven Malabari buck of one to one and half years have been reported. The sperm count for Malabari buck was lower than that reported for Beetal bucks. Comparison of the results with those reported for ram even revealed close resemblance in semen characteristics between the two species.

**10 OBSERVATION ON HERMAPHRODITISM IN A GOAT**  
Raja, C. K. S. V.

*Kerala vet.*, (1965) 4, 63-66

A case of true hermaphroditism in a Malabari goat of hornless variety showing predominantly male secondary sexual characteristics was reported. Macroscopic and microscopic observations made on the reproductive organs as well as on the pituitary and adrenal glands removed from the animal were described.

**11 AN ENQUIRY INTO THE SUITABILITY OF COCONUT  
WATER AS A CONSTITUENT OF SEMEN DILUENT**

Vaidyanatha Iyer, A. & Raja, C. K. S. V.

*Kerala Vet. Coll. Res. Inst., Mag.*, (1968) 12, 6-12

In order to find out the keeping quality of bull semen in coconut wateryolk-citrate diluent, a comparative study of the motility and livability of sperms suspended in yolk citrate and coconut water yolk-citrate was undertaken. The motility



and percentage of live sperms on storage upto 72 hours in the two media were recorded. The results on analysing statistically showed that the addition of coconut water in yolk citrate is of definite advantage in increasing keeping quality of semen.

## 12 EFFECT OF CROSS-BREEDING AND GRADING-UP ON THE GESTATION PERIOD IN LOCAL CATTLE

Bharathan Namboodiripad, T. R. and Mathai, E.

*Kerala vet. Coll. Res. Inst. Mag.*, (1970) 14, 11-15

A study of the gestation period of local cows when bred with Jersey and Sindhi was made by analysing the data of 433 births recorded in Key Village Block, Trichur.

In local cows the average gestation period was  $280.19 \pm 0.61$  days (for male calf) and  $279.44 \pm 0.92$  days (for female calf) when bred with Jersey Bull. Male and Female graded Sindhi calves were carried for a term of  $284.05 \pm 0.49$  days and  $281.74 \pm 0.60$  days respectively. The breed of Sire had a significant influence on gestation period. Sex of calf had a significant influence on gestation in graded Sindhi births, while the same in cross bred Jersey births, was not significant.

## 13 EFFECT OF AGE OF SEMEN ON CONCEPTION RATE IN COWS

Mathai, E; Bharathan Namboodiripad, T. R. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1970) 1, 60-64.

The data on the rate of conception in a total of 2592 artificial inseminations done in the A. I. units of the Kerala Veterinary College, Mannuthy, and Key Village Centres, Trichur with semen, stored for varying lengths of time viz. 0 to 20, 21 to 40, 41 to 60 and 61 to 80 hours were subjected to statistical analysis. The semen samples were from one Jersey and three Sindhi bulls maintained at the A. I. Unit of the College. The analysis revealed a significant difference in the conception rate among bulls ( $P < 0.05$ ) and between different age group of semen ( $P < 0.01$ ). On an average the reduction in the percentage of conception is found to be 3.68 for every ten hours of storage upto 80 hours.

#### 14 MACERATION OF FOETUS IN A SHE BUFFALOE

Mathai, E; Bharathan Namboodiripad, T. R, Nair, K. P.  
and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1970) 1, 121-123

A case of foetal maceration in a non descript she-buffaloe resulting in perimetritis and parametritis due to perforation of the uterine wall by foetal bone is reported. Histo-pathological findings of the affected organs are described.

#### 15 EFFECT OF AGE OF SEMEN ON SEX OF CALF

Mathai, E. and Bharathan Namboodiripad, T. R.

*India vet. J.*, (1970) 47, 315-318

In order to find out the effect of age of semen on sex of calf, 777 normal births in local cattle were subjected to statistical analysis. It was found that the percent age of male calves born to semen in the age group of 0 to 20, 21 to 40 and 41 to 60 hours were 43.1, 51.8 and 47.2 respectively. The difference in the proportion of male born to semen in the age group of 21 to 40 hours was significantly higher ( $P < 0.01$ ) than that of 0 to 20 hours. But there was no significant difference in the proportion of male born to semen of 41 to 60 hours when compared to that of either 0 to 20 hours or 21 to 40 hours.

#### 16 STUDIES ON PHYSICAL AND BIOCHEMICAL CHARACTERS OF SINDHI BULL SEMEN

Maggie Menachery and Lucy Paily

*Kerala J. vet. Sci.*, (1970) 1, 26-32

Evidence is presented to indicate that the physical and the biochemical characteristics of Sindhi bull semen vary widely between bulls as also in different ejaculates from the same bull. The seminal characteristics do not also appear to bear any correlation among them.

#### 17 THE EFFICACY OF INTRAUTERINE ANTIBIOTIC TREATMENT IN 'REPEAT BREEDER' COWS

Bharathan Namboodiripad, T. R. and Mathai, E.

*Kerala J. vet. Sci.*, (1970) 1, 60-64

Results of studies conducted to determine the efficacy of post service intra uterine treatment with streptomycin,

penicillin and omnamycin in cows of the District Livestock Farm attached to the Kerala Veterinary College and Research Institute, Mannuthy, are reported. A total of 7 'repeaters' received treatment with antibiotics 6 hours after insemination—26 animals with Streptomycin-Penicillin and 11 with Omnamycin. Eight animals were left untreated to serve as control. An overall conception rate of 80.77% and 81.08% respectively was obtained for the Strepto-penicillin and Omnamycin treated animals while the conception rate in the control group was only 25%. The difference observed in the conception rate between the treated and control groups is statistically significant, whereas the difference in the conception rate among the two treated groups is not significant, thus conferring no specific advantage of one over the other antibiotic.

#### 18 SUCCESSFUL TREATMENT OF PERINEAL TEAR AND RECTOVAGINAL FISTULA IN A BROWN SWISS COW

Mathai, E. and Venugopalan, A.

*Indian vet. J.*, (1970) 47, 1007-1011

Successful treatment of perineal tear and recto-vaginal fistula in a Brown Swiss cow is reported. The techniques for the repair of such conditions advocated by different authors are discussed. The case was treated according to the method recommended by Frank, with slight modification.

#### 19 FREAKS OF NATURE

Raja, C. K. S. V., Neelakantan, C. P., Bharathan Namboodiripad, T. R and Mathai, E,

*Kerala vet. Coll. Res. Institute Mag.*, (1970) 14, 41-46

A detailed account of the anomalies encountered in cattle, goats, pigs and poultry during the routine work in the clinics was presented.

#### 20 EFFECT OF OXYTOCIN THERAPY ON POST-PARTUM HEAT IN COWS

Mathai, E.; Bharathan Namboodiripad, T. R. and Raja., C. K. S. V.

*Kerala vet. Coll. Res. Institute Mag.*, (1971) 15, 50-52

A limited study conducted on 68 Sindhi cows of District Livestock Farm attached to Kerala Veterinary College and

Research Institute shows that injection of 50 units of oxytocin within six hours after calving is effective to hasten the onset of post-partum heat in cows.

## 21 A REPORT OF TRIPLE BIRTH IN A COW

Rajagopalan, P; Mathai, E; Bharathan Namboodiripad T.R. and Neelakantan, C. P.

*Kerala vet. Coll. Res. Institute Mag* (1971) 15, 60-62

A case of triple birth in a cross-bred Jersey cow is reported. It is peculiar that all the calves were delivered unaided.

## 22 A STUDY ON THE GENITAL INVOLUTION IN SINDHI COWS

Francis, E. C. and Raja, C. K. S. V.

*Kerala J. vet. Sci.* (1971) 2, 113-118

An investigation on involution of uterus and vulva was made in 30 Sindhi cows of the Livestock Farm attached to Kerala Veterinary College and Research Institute. The time required for complete involution of uterus varied from 32 to 44 days with a mean of  $36.27 \pm 0.69$  days. Involution of vulva was complete between 24 to 40 days with a mean of  $31.60 \pm 0.73$  days. The rate of involution of vulva is greater than that of uterus. A linear correlation between the involution time of the two organs ( $\pm 0.46$ ) is also evident.

Factors such as calving sequence, gestation, length, sex and birth weight of calf have no significant influence on the rate of involution.

## 23 A NOTE ON EARLY PREGNANCY DIAGNOSIS IN COWS

Sethumadhavan, A. and Raja, C. K. S. V.

*Kerala J. vet. Sci.* (1971) 2, 131-134

Simple chemical tests using cervical mucus with 10% sodium hydroxide or distilled water for diagnosing early pregnancy in cows are described.

## 24 TESTICULAR FIBROSIS IN A JERSEY BULL

Raja C. K. S. V; Namboodiripad, T. R. B; Mathai, E. and Nair, K. P.

*Kerala J. Vet. Sci.*, (1971) 2, 71-74

A case of testicular fibrosis leading azoospermia in a seven year old imported jersey bull is described. Histopathological studies of the testicles revealed complete destruction and replacement of seminiferous tubules and Leyding cells by fibrous tissue. Loss of libido, not usually observed in testicular degeneration, was an interesting feature of the present case.

## 25 STUDIES ON THE INCIDENCE OF EARLY EMBRYONIC LOSS IN GOATS BASED ON ABATTOIR SPECIMENS

Achuthankutty, A. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1971) 2, 13-15

In a study of embryonic mortality in goats, 175 gravid uteri with their ovaries intact, were collected from Municipal slaughter house, Trichur. The corpora lutea in the ovaries and the number of embryos in each horn were recorded, the difference between the above two numbers being taken as the index of prenatal loss of embryo. The data were also made use of to study the functional status of ovaries, rate of twin and multiple gestations and the incidence of trans-uterine migration of ova. Early embryonic mortality was noticed in 23.29% of genitalia studied. Out of the overall prenatal loss of 14.9%, 11.1% occurred before 40th day of gestation the estimated actual loss of embryo after 40th day of gestation. The estimated actual loss of embryo after 40 days of pregnancy was only 5.6%.

Out of 302 ova produced, 133 (44%) were found released from the left ovary and 169 (56%) from the right ovary. This difference in the functional activity of the two ovaries was observed to be highly significant. The percentage of single, twin and triple pregnancy in goats was found to be 56.81, 41.47 and 1.71 respectively.

In 176 genitalia studied in goats, 41.48% showed evidence of transuterine migration. The rates of migration, from right horn to left and left horn to right were 38.4% and 91.6%

respectively. This difference in the rate of migration between two horns was significant. Out of 73 genitalia which revealed trans-uterine migration 45 (61.6%) showed multiple ovulations from a single ovary whereas 27(37%) had only single ovulations. In spite of bilateral ovulations, migration was seen in one case (1.4%).

## **26 FACTORS INFLUENCING THE INCIDENCE OF REPEAT BREEDING IN COWS**

Bharathan Namboodiripad, T. R. and Raja, C. K. S. V.  
*Kerala J. vet. Sci.*, (1972) 3, 169-175

The breeding record of 264 Red Sindhi females of the District livestock farm, Mannuthy over a period 10 years from 1961 to 1971 covering 689 reproductive periods were reviewed to assess the incidence of repeat breeding. The incidence in the herd was 18.58%. It was noticed that repeat breeding increased in proportion to parity of animals. The condition was not found to be a repeatable trait. Chances of repeat breeding are more after gestational accidents and post-partum complications.

## **27 A STUDY ON THE LITTER SIZE AND SEX RATIO IN PIGS**

Mathai, E. and Ramachandran, P.  
*Kerala J. vet. Sci.*, (1972) 3, 1-5

A study on the litter size and sex ratio in Large White Yorkshire pigs was carried out based on the breeding records of the Pig Breeding Farm, Mannuthy. The following observations were made.

The average litter size was 7.39 and the secondary sex ratio 51:52.

For summer, rainy and winter seasons the litter size was respectively 7.08, 7.37 and 7.64 and the sex ratio 51.59, 50.59 and 52.71. Both litter size and sex ratio were highest in winter.

The influence of age of dam on litter size and sex ratio was not significant.

The influence of parity on sex ratio was not significant.

## 28 A STUDY ON PARTURITION IN YORKSHIRE PIGS

Mathai, E., Madhavan, E. and Ramachandran, P.

*Kerala J. vet. Sci.* (1972) 3, 158-163

The process of parturition was observed in 28 Large White Yorkshire Pigs and Pig Breeding Farm, Mannuthy. The time taken for the expulsion of piglings in a litter, the average time required for the birth of one pigling, the average litter size and the average duration of the phase of expulsion of piglings and the number of piglings in a litter showed significant correlation. 29% of the piglings were born as posterior presentation. The time for expulsion of piglings and placenta was not significantly correlated. The mean value for the total time taken for farrowing was 6 hours 31 minutes. Highly significant correlation was noticed between the total time taken for farrowing and the number of piglings in a litter. The average weight of the pigling and placenta was 1.21 kg and 1.27 kg respectively. The weight of placenta was found to be significantly correlated to the total weight of piglings in a litter.

## 29 PATHOLOGICAL CONDITIONS IN THE GENITAL ORGANS OF EWES

Prabhakaran Nair, K. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1972) 3, 14-17

One thousand and fifty ewe genitalia inclusive of 409 gravid ones, collected from the Municipal slaughter house, Trichur, were studied for different pathological conditions.

The overall incidence of lesions was 1.6%. The following conditions were recorded viz. par-ovarian cyst (0.190%), ovarian abscess (0.095%). Ovario-bursal adhesions (0.476%), maceratio foeti (0.970%), pyometra (0.190%), haematic mummification (0.285%) and inter-cotyledonary haemorrhage (0.095%).

## 30 INVESTIGATIONS ON SPECIFIC INFECTIOUS INFERTILITY IN BOVINES IN KERALA

Bharathan Namboodiripad, T. R. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1972) 3, 49-52

Incidence of specific genital infections viz, Brucellosis, Vibriosis and Trichomoniasis was investigated in the animals

of Livestock Farm, College of Veterinary and Animal Sciences, Mannuthy. Five out of 144 (3.47%) animals gave positive reaction to the mucus agglutination test for vibriosis. However, attempts to isolate the organism from the reactors were not successful.

**31 A STUDY ON THE EFFECT OF 'FORTEGE' ON SEXUAL DESIRE AND QUALITY OF SEMEN OF BREEDING BULLS**

Ramakrishna Pillai, V. K. and Neelakanta Iyer, C. P.  
*Kerala J. vet. Sci.*, (1972) **3**, 67-70

The reaction time was found to be significantly reduced in sexual normal Sindhi bulls, in limited trials with 'Fortege' at 15 tablets per day per bull for 7 days followed by 10 tablets daily for the next 7 days. Slight rise in the average sperm concentration and motility rate of sperm were also noticed. Sindhi bulls with low sex vigour when similarly treated with 'Fortege' showed improvement in sexual activity but their disinclination to serve persisted without change.

**32 A NOTE ON THE INCIDENCE OF OCULAR AFFECTIONS IN CROSS-BRED CALVES**

Mathai, E. and Muraleedharan Nair, K. N.  
*Kerala J. vet. Sci.*, (1972) **3**, 82-88

The overall incidence of ocular disease in crossbred calves of the College Livestock Farm was 32.53%. The highest incidence was observed in F2 calves.

**33 STUDIES ON THE GRAVID GENITALIA OF SHEEP**

Prabhakaran Nair, K. and Raja, C. K. S. V.  
*Kerala J. Vet. Sci.*, (1972) **3**, 82-87

The functional status of the ovaries and uterine horns, incidence of transuterine migration, multiple pregnancy and embryonic loss were studied in 400 gravid genitalia of sheep. Cotyledons in 54 gravid genitalia were also counted. 56.3% of all corpora lutea were in the right ovary and 58.21% of the fetuses in the right uterine horn. The rate of migration was 15.54% in single ovulations as against 88.86% in multiple ovulations. The incidence of single, twin and triplet pregnancy was 96.82%, 2.93% and 2.40% respectively.



The overall incidence of ovum/embryo loss was more during the first 40 days of gestation.

The number of cotyledons in the gravid genitalia of ewes ranged between 39 and 92 with an average of 66. In single pregnancy, the horn carrying the foetus had more cotyledons than the non-gravid horn.

#### 34 INVESTIGATIONS ON THE PATHOLOGICAL CONDITIONS IN THE FEMALE GENITAL ORGANS OF THE GOAT

Prabhakaran Nair, K. and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1972) 3, 106-119

The pathological conditions of the caprine female genitalia were studied by examination of 1860 specimens including 400 gravid ones collected from Municipal slaughter house, Trichur. The overall incidences of lesions was 2.15%. The following conditions were recorded viz cystic ovary (0.322%), ovarian abscess (0.053%), hydro-salpinx (0.107%), cyst in the salpinx (0.053%), salpingitis (0.053%) perisalpingitis (0.053%), maceratiofoeti (0.752%), pyometra (0.322%), hydro-metra (0.161%), metritis (0.053%), perimetritis (0.053%), parametritis (0.053%), haematic mummification (0.053%) interplacental haemorrhage (0.053%), uterine rupture (0.053%), and retained foetal cotyledons (0.106%).

#### 35 STUDIES ON THE GRAVID GENITALIA OF GOATS

Prabhakaran Nair, K., and Raja, C. K. S. V.

*Indian Vet. J.* (1973) 50, 42-50

338 gravid genitalia ranging from 15 days to term were studied in detail.

The embryonic loss was evident in 18.48% of the genitalia examined. The loss during the first 40 days of gestation was 10.79% as against the estimated loss of 3.85% beyond 40 days. The ovum/embryo loss was found to be much higher (33.33%) in multiple ovulation when more than two ova were shed.

The incidence of transuterine migration of ova was 37.35%. The rate of migration was observed to be much higher (83.35%) in multiple ovulation from single ovary. The rate of

single, twin, triplet and quadruplet pregnancy was found to be 54.82%, 59.75%, 5.12% and 0.3%. The right ovary contained 53.7% C. L. and the right horn 51.89% fetuses.

The average number of cotyledons in the gravid genitalia of goats was 99. In single pregnancy the horn with the foetus had more maternal caruncles than non gravid horn.

Six genitalia had each one foetus in excess of the expected number, based on the number of C. L. in the ovaries. This was attributed to monozygosity or to polyovular follicles and polynuclear ova.

### 36 A NOTE ON THE INCIDENCE OF ABORTION AND RETENTION OF PLACENTA IN CATTLE

Bharathan Namboodiripad, T. R., Mathai, E. and Raja, C. K. S. V.

*Coll. Vet. Anim. Sci. Annual*, (1973) **17**, 39-41

The incidence of abortion and retention of placenta in the cows of Livestock Farm, Mannuthy was found to be 8.1% and 3.23% respectively. Abortion rate increased with parity of animals.

### 37 SKELETAL DEFORMITIES IN BOVINE FOETUS

Prabhakaran Nair, K.; Mathai, E; Namboodiripad, T. R. B., Neelakantan, C. P., and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1973) **4**, 30-34

Two cases of Perosomus elumbis and one case of Perosomus hordis of bovine foetus encountered during the course of routine clinical studies were reported.

### 38 A CLINICAL STUDY OF CYSTIC OVARY IN CATTLE

Namboodiripad, T. R. B; Mathai, E., and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1973) **4**, 39-42

The incidence of cystic ovary in Sindhi herd maintained at the College Livestock Farm, Mannuthy was 3.98%. The cysts were common in cows in second lactation. The luteal cysts were more frequent in occurrence than the follicular cysts. Manual rupture of the cysts per rectum gave good results in 13 out of 16 cases.

39 A NOTE ON THE EFFICACY OF ADMINISTRATION OF PHOSPHORUS COMPOUND AND VITAMIN-A ON THE ONSET OF POST-PARTUM HEAT IN COWS

Mathai, E; Nambodiripad, T. R. B. and Raja, C. K. S. V  
*Kerala J. Vet. Sci.*, (1973) 4, 70-72

Administration of 'Tonophosphan' and 'Prepalin' has hastened the process of involution of uterus and the onset of post partum heat in cows.

40 A NOTE ON NORMAL PARTURITION IN CROSS BRED COWS

Mathai, E, and Raja, C. K. S. V  
*Kerala J. Vet. Sci.* (1973) 4, 151-153

The process of normal parturition in 14 Jersey-Sindhi cows was observed. The average time taken for the first, second and third stages of parturition were found to be 4 hours 7 minutes, 1 hour 12 minutes and 4 hour 15 minutes respectively.

41 EFFECT OF ADMINISTRATION OF POTASSIUM IODIDE ON SEX DESIRE AND SEMEN CHARACTERISTICS OF BREEDING BULLS

Ibrahim, M and Neelakanta Iyer, C. P.  
*Kerala J. Vet. Sci.*, (1973) 4, 178-180

Administration of 50 milligram of potassium iodide daily for a period of 30 days significantly improved sex vigour as well as volume, concentration and motility of sperm in Jersey-Sindhi bulls.

42 PREGNANCY DIAGNOSIS IN GOATS BY BIOLOGICAL METHODS

Sudarsanan, V., and Raja, C. K. S. V.  
*Kerala J. Vet. Sci.*, (1973) 4, 78-89

The ovario uterine response of immature rats to gonadotrophic factor in the sera from goats of 30 days gestation was pronounced to be of value as a test for diagnosing early pregnancy. Oestrogen present in the urine of goat in the latter half of gestation caused proliferation of endometrium and stratification of vaginal epithelium of ovariectomised rats, but vaginal smears of the rats failed to show cornified cells.

#### 43 A STUDY ON THE PRESERVATION OF BUCK SEMEN

John, K. J. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1973) 4, 90-93

The merit of E. Y. C., Y. G. C, cows milk and goats milk as extender of goat semen was compared using 29 samples of semen collected from Malabari bucks. The motility and livability of sperms in the four extenders were assessed at 24 hour intervals and values compared. Cows milk for preserving goat semen was found to be superior. E. Y. C. and Y. G. C. maintained motility and livability only for 48 hours.

#### 44 THE FRUCTOSE, CITRIC ACID AND ASCORBIC ACID CONTENT IN THE SEMEN OF MALABARI BUCKS.

Patel, R. V. and Raja, C. K. S. V.

*Kerala J. vet. Sic.*, (1973) 4, 94-95

The fructose, citric acid and ascorbic acid contents in the semen of Malabari bucks were estimated.

The fructose level was observed to vary from 320.00 mg. to 866.15mg/100ml. The citric acid was in the range of 581.25 mg to 746.60 mg/100ml. with a mean of  $641.74 \pm 40.15$ mg/100ml. The level of ascorbic acid was found to vary from 6.87 mg to 14.16 mg/100ml. with a mean of  $11.72 \pm 1.04$  mg/100ml. It is concluded that the levels of the reducing substances in the semen are higher in bucks of Malabari breed than in ram.

#### 45 OBSERVATION ON CONCEPTION, GESTATION PERIOD, MULTIPLE BIRTH AND INFERTILITY IN MALABARI GOATS

Sudarsanan, V. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1973) 4, 96-98

The overall conception rate in Malabari goats with 3 matings were  $75.8 \pm 8.0\%$ . The mean gestation period of single, twin and triplet pregnancies were 142.3, 147.2 and 146.3 days respectively. The incidence of single, twin and triplets in goats was 47%, 35.29% and 17.65% respectively. The incidence of infertility was  $41.3 \pm 9.0\%$ .

#### 46 BIOMETRICS OF SPERMS OF MALABARI BUCKS

Patel, R. V. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1973) 4, 162-164

The mean length, width and width at the base of the sperm head of Malabari bucks were found to be 8.39 microns, 4.27 microns and 2.45 microns respectively. Length and width of middle piece were 11.81 microns and 1.06 microns. Length of tail was 41.26 microns.

#### 47 A COMPARATIVE STUDY ON THE BIRTH WEIGHT OF SINDHI AND JERSEY-SINDHI CALVES.

Mathai, E.; Francis, U. T., and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1974) 5, 9-14

The mean birth weight of Sindhi, Jersey-Sindhi  $F_1$  and Jersey Sindhi  $F_2$  calves were observed to be 20.05 kg, 20.59 kg, and 20.37 kg respectively. The birth weight of Jersey-Sindhi  $F_1$  calves was significantly more than that of Sindhi and Jersey-Sindhi  $F_2$  calves. Significant variation was noted in the birth weight of male and female calves. The parity status of the dam had a significant influence on the birth weight of calves. The birth weight was not influenced by the calving season.

#### 48 CYSTIC PERSISTANT MESONEPHRIC TUBULES IN BOARS

Thomas, U. P., and Raja, C.K. S. V.

*Kerala J. vet. Sci.*, (1974) 5, 35-41

In a study of epididymis in the pigs of different ages varying from one to 270 days, cysts were encountered in the caput epididymis in 22 out of 144 animals. Histological examination indicated these to be cystic persistent mesonephric tubules.

#### 49 SPERMATIC GRANULOMA IN BOAR

Thomas, U. P. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1974) 5, 113-120

Testis and epididymis from 137 pigs were examined and spermatic granuloma was encountered in four boars. Bilateral involvement of the caput was encountered in one boar. In two cases the left epididymis showed lesions in the caput. In the other the right epididymis was involved, the lesions being confined to the cauda. The observation made in each case and the possible histogenesis were discussed.

**50 CONGENITAL TAIL ABNORMALITIES OF SPERMATOA IN A JERSEY BULL.**

Raja, C. K. S. V; Mathai, E; Nair, K. P. and Namboodiripad. T. R. B.

*Kerala J. vet. Sci.*, (1974) 5, 44-49

A case of sperm akinesia in a Jersey bull associated with a high percentage of bent and coiled tails of spermatozoa, probably due to pathological compositions of epididymal plasma consequent to primary functional disturbances of epididymal epithelium was reported.

**51 STUDY ON THE PATHOLOGICAL CONDITIONS IN THE REPRODUCTIVE ORGANS OF COWS.**

II. Pathology of salpinx, bursa and broad ligament.

Prabhakaran Nair, K. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1974) 5, 171-181

Forty four out of 1250 (3.52%) genitalia examined were found to be affected with pathological conditions of the salpinx, bursa, and broad ligament. The various conditions encountered were intramucosal cysts in the salpinx (0.32%), acute salpingitis (0.16%), chronic catarrhal salpingitis (0.08%), papillary hyperplasia (0.08%), hydrosalpinx (0.16%), chronic bursitis (2%), hydrops bursa (0.16%) parovarian cyst (0.32%), parovarian abscess (0.16%) and Zenkers' degeneration of the broad ligament (0.08%).

**52 STUDY ON THE PATHOLOGICAL CONDITIONS IN THE REPRODUCTIVE ORGANS OF COWS.**

IV. Pathology of cervix.

Prabhakaran Nir, K. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1975) 6, 114-120

Thirteen out of the 1250 (1.04%) cervix examined showed lesions. The lesions encountered were cervicitis (0.56%), Nabothian cysts (0.24), pericervical abscess (0.16%) and haemosiderosis (0.08%).

**53 STUDY ON THE PATHOLOGICAL CONDITIONS IN THE REPRODUCTIVE ORGANS OF COWS.**

V. Pathology of vagina and vulva.

Prabhakaran Nair, K. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1975) **6**, 121-127

Thirty seven cow genitalia out of 1250 (2.96%) examined showed various pathological lesions of the vagina and vulva. The conditions encountered were cystic Gartner's duct (0.32%), vaginitis (0.16%), granular vulvo-vaginitis (2.4%) and squamous cell carcinoma (0.08%).

**54 INFLAMMATORY LESIONS IN THE UTERUS OF COWS**

Prabhakaran Nair, K. and Raja, C. K. S. V.

*Indian J. Anim. Sci.*, (1975) **45**, (12), 958-961

One thousand two hundred and fifty genitalia inclusive of 150 gravid ones from non-descript cows slaughtered at Municipal slaughter house, Trichur were examined for inflammatory lesions of the uterus. Seventeen (1.36%) genitalia showed inflammatory lesions. The conditions recorded were necrotic metritis (0.08%) chronic nonsuppurative metritis (0.08%) acute suppurative endometritis (0.16%) acute non-suppurative endo-metritis (0.43%) chronic non-suppurative endometritis (9.16%) perimetritis (0.16%) and hydrometra (0.24%).

**55 PATHOLOGICAL CONDITIONS IN THE UTERUS OF COWS: MISCELLANEOUS LESIONS**

Prabhakaran Nair, K. and Raja, C. K. S. V.

*Indian J. Anim. Sci.*, (1976) **46**, 228-233

One thousand two hundred and fifty genitalia inclusive of 550 gravid ones from non-descript cows slaughtered at the Municipal slaughter House, Trichur, were examined for pathological conditions of the uterus. Forty two (3.36%) genitalia revealed various miscellaneous pathological conditions of the uterus. The conditions recorded were mummified foetus (0.08%), cystic glandular hyperplasia (0.40%) cyst in the uterus (0.32%), adenomyosis (0.16%), sub-epithelial haemorrhage (0.24%) and senile atrophy (2.16%)

56 INVITRO ANTIBIOTIC SUSCEPTIBILITY OF ISOLATES FROM THE UTERUS AND THE EFFICACY OF INTRA-UTERINE TREATMENT IN REPEAT BREEDER COWS

Bharathan Namboodiripad, T. R., Raja, C. K. S. V. and Abdulla, P. K.

*Kerala J. vet. Sci.*, (1976) 7, 57-61

Bacteriological study of the uterine samples of 26 repeaters revealed isolations of Proteus from 7, Pseudomonas from 7, Escherichia from 4, and Aerobacter and Staphylococcus from one each and mixed infections from 6. The intra-uterine therapy of repeaters with specific antibiotics selected on the basis of *invitro* sensitivity of the isolates was observed to be very effective.

57 A NOTE ON NEOPLASTIC LESIONS IN THE UTERUS OF COWS

Prabhakaran Nair, K. and Raja, C. K. S. V.

*Indian J. Anim. Sci.*, (1976) 46, 368-370

Four neoplastic lesions in the uterus of cows are described in the paper. The conditions reported are adenomatous endometrial hyperplasia (0.08%), capillary angioma (0.16%) and fibroadenoma (0.08%).

58 A STUDY ON THE GROWTH AND AGE AT PUBERTY OF JERSEY-SINDHI FEMALES UNDER DIFFERENT REGIME OF FEEDING

Mathai, E. and Raja, C. K. S. V.

*Kerala J. vet. Sci.* (1976) 7, 114-123

The birth weight of Jersey-Sindhi F<sub>1</sub> female calves varies from 19.5 kg to 21.5 kg with a mean of  $20.2 \pm 0.48$  kg. The weight of calves at weaning (60th day) is in the range of 30.3 kg to 43.2 kg with a mean of  $36.0 \pm 0.838$  kg. The birth weight of calves is found to have significant influence on their weight at weaning. The growth rate, age at puberty and weight at puberty are influenced by the level of feeding.



## 59 A STUDY ON THE ETIOLOGY OF REPEAT BREEDING IN COWS

Bharathan Namboodiripad, T. R. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1976) 7, 195-199

An investigation on the etiology of repeat breeding was carried out on 41 repeaters from a herd of 99 Sindhi and 25 Jersey-Sindhi cross bred adult females. The incidence of ovulatory disturbances and ovario-bursal adhesion was observed to be 21.95% and 4.88% respectively. Four animals (9.76%) gave immunological evidence for vibriosis. The predominant cause for repeat breeding was noted to be uterine infection with nonspecific organisms.

## 60 PHYSICAL CHARACTERISTICS OF SEMEN OF YORKSHIRE BOARS

Sreekumaran, T. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1976) 7, 84-92

Semen samples collected using artificial vagina from 9 Large White Yorkshire boars aged 12 to 18 months were analysed to study the physical characteristics of boar semen.

Average values for the various characters observed were: The total volume of the ejaculate and gel free volume were 165.05 ml and 114.25 ml respectively. The gel portion amounted to 51.59 ml. Motility was found to be 65.74% and pH 7.61. Sperm count amounted to 2.5 lakhs/ cubic mm. Highly significant correlation between sperm count and motility was observed. Live sperm comes to 88.08%. There is significant correlation between live sperm count and initial motility. Total abnormality of sperm was 7.33%, abnormality of head, middle piece and tail were found to be 1.66%, 2.32% and 3.20% respectively. The percentage of proximal and distal protoplasmic droplets were 2.84 and 2.96. A significant variation between boars in the total volume, gel free volume, motility, live sperm count, abnormality of sperm and sperm with protoplasmic droplets were observed.

**61 A PRELIMINARY STUDY ON UTERO-TUBAL INSUFFLATION OF THE BOVINE GENITALIA**

Prabhakaran Nair, K and Raja, C. K. S. V.

*Indian vet. J.*, (1977) 54, 309-312

Forty eight genitalia of nondescript cows were subjected to uterotubal insufflation test for diagnosing tubal impatency. Bilateral patency was observed in 10 (20.84%) genitalia. Unilateral and bilateral impatency were recorded in 14 (29.16%) and 24 (50%) genitalia respectively. The incidence of impatency of the left salpinx (10) was found to be more than that on the right (4). Since the safety margin, i.e. the difference between the highest pressure at which air escapes through the normally patent salpinx and the maximum safe pressure is too low and not uniformly observed in all cases, the test is considered unsafe in cattle.

**62 STUDIES ON THE EFFECT OF VITAMIN-A DEFICIENCY ON SEXUAL ORGANS OF BOARS. (i) GROWTH RATE AND CLINICAL SYMPTOMS OF DEFICIENT BOARS**

Appa Rao, B. C. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1977) 8, 87-94

Studies were made on the growth rate and clinical symptoms in experimentally produced Avitaminosis-A in boars.

1. The growth rate was not affected in boars maintained on Vitamin-A deficient diet. The deficient animals showed normal appetite and continued to eat the ration throughout the period of experiment. This might have been the reason for not observing a reduced growth rate in the deficient boars.

2. Skin lesions characterised by loss of glossiness and lusture of haircoat was the first symptom noticed in Avitaminosis-A in pigs. This was followed by the formation of brownish greasy crust on the skin all over the body. These early symptoms were observed by 165 days of deficient feeding. The level of Vitamin A in the blood at that time was 100 microgram/100 ml. In advanced stage of deficiency, when the Vitamin A level in the blood dropped below 5 microgram/100ml the boars appeared lethargic and exhausted and showed recurrent convulsive attacks.

### 63 BIOCHEMICAL CHARACTERISTICS OF SEMEN OF YORKSHIRE BOARS

Sreekumaran, T. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1977) **8**, 211-214

Fifty four semen samples collected using artificial vagina from nine Large White Yorkshire boars aged from 12-18 months were analysed for its biochemical characteristics of semen.

The biochemical constituents observed were: Fructose (17.26mg%), Citric acid (153.56mg%), Ascorbic acid (3.56mg%), Total protein (4.11mg%), Creatinine (1.24mg%), Sodium (466.23m%), Potassium (202.07mg%), Calcium (7.49mg%), Magnesium (7.49mg%), Chloride (377.03mg%), Inorganic phosphorus (28.56mg%), Ester phosphorus (24.22mg%) and Lipid phosphorus (16mg%). Significant variation between boars were observed in the level of fructose, ascorbic acid, calcium, magnesium and chloride.

### 64 STUDIES ON THE EFFECT OF VITAMIN-A DEFICIENCY ON SEXUAL ORGANS OF BOARS (ii) DEVELOPMENT OF TESTIS AND ACCESSORY SEX ORGANS OF THE DEFICIENT BOARS

Appa Rao, B. C. and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1977) **8**, 95-108

The gross and microscopic changes of testis and accessory organs in experimentally produced avitaminosis-A in boars were studied. The following observations were made:

1 A gradual but conspicuous reduction in the weight of the testicles of the boars fed Vitamin-A deficient diet was observed. Testicular weight in avitaminosis boars was half to 1/3 of normal. Progressive degeneration of seminiferous tubule was observed histologically. Initiation of degeneration was noticed at 165 days of deficient feeding. By 225 days there was almost complete cessation of spermatogenesis, marked degeneration and complete arrest of spermatogenesis, was noticed when deficient feeding was continued upto and beyond 270 days. Interstitial cells were not affected even in advanced stages of deficiency.

2 Significant reduction in the weight of epididymis was observed in deficient boars. However structural alterations characterized by squamous metaplasia of the duct epithelium was present only in advanced stage of deficiency.

3 Pathological changes in the accessory sex organs were not pronounced in deficient boars. The reasons for this might be attributed to the normal feed intake of the deficient animals and non-involvement of the interstitial cells of Leydig.

#### 65 STUDIES ON THE EFFECT OF VITAMIN-A DEFICIENCY ON SEXUAL ORGANS OF BOARS (iii) REPLACEMENT THERAPY OF VITAMIN-A DEFICIENT BOARS

Appa Rao, B. C. and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1977) 8, 109-118

1 Supplementation of Vitamin-A has been found to have quick and marked effect in alleviating the clinical symptoms shown by the deficient boars.

2 Regeneration of testicular tissues of Vitamin-A deficient boars was initiated within 15 days of Vitamin-A supplementation. The testicles appeared completely regenerated and normal within 45 days of treatment. However when the deficient feeding was continued for longer days the supplementation of Vitamin-A for a period of 45 days did not bring about complete regeneration. It is thus concluded that injury to the spermatogenous tissues on account of Avitaminosis-A is reversible but the spermatogenic activity could be restored to normality only if the deficiency is made good by supplementation at early stages.

#### 66 PATTERN OF OESTROUS CYCLE IN JERSEY-SINDHI HEIFERS

Mathai, E. and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1978) 9, 159-166

Seventy two oestrous cycles of Jersey-Sindhi heifers were studied. The average length of oestrous cycle and duration of oestrus were observed to be  $20.71 \pm 0.198$  days and  $17.77 \pm 0.856$  hours, respectively. Time of ovulation was on an average  $12.39 \pm 0.708$  hours after the end of heat. Incidence of anovulatory heat was 9.7%. Right ovary was found more active than the left. Metestrous bleeding was noted in 2.72 percent of the heifers.

**67 STUDIES ON CERTAIN FACTORS INFLUENCING BIRTH WEIGHT IN SINDHI AND JERSEY GRADES**

Mathai, E., Jacob, E. T., Abraham, K. C. and Nair, B. R. K.  
*Kerala J. Vet. Sci.*, (1979) 9, 5-14

Overall average birth weight of 393 calves was found to be  $17.22 \pm 0.14$  kg. Average weight of male and female calves were  $17.76 \pm 0.19$  kg. and  $16.66 \pm 0.19$  kg. respectively. It was observed that as the percentage of local nondescript inheritance increased, the birth weight decreased. Birth weight was found to be more in calves born in summer and less in those born in winter. When the gestation period increased by one day the birth weight also increased by 0.072 kg. The sex of calf, genetic group of the dam, breed of sire, genetic group of calf, season of birth and gestation period significantly influenced the birth weight of calves.

**68 STUDIES ON THE BIOMETRY, HISTOLOGY AND HISTOCHEMISTRY OF CORPUS LUTEUM AT DIFFERENT STAGE OF PREGNANCY IN GOAT**

Mathai, E.; Nair, K. P. and Raja, C. K. S. V.  
*Kerala J. Vet. Sci.*, (1978) 9, 38-46

Ovaries from 52 gravid genitalia were collected for the study. Various parameters of ovary and corpus luteum of pregnancy were recorded. As the stage of gestation progressed there was an appreciable decrease in the number of follicles in ovaries. The right ovary showed significantly greater activity. During second trimester the corpus luteum showed significant increase in weight and diameter.

Mild degenerative change of luteal cells was noted during first trimester of gestation. This gradually progressed and became very marked in the third trimester of gestation. Intensity of alkaline phosphatase reaction was very much marked in the first trimester and this became less pronounced during third trimester of gestations. Acid phosphatase reaction was marked during first. The intensity of reaction decreased as the stage of gestation progressed.

## 69 STUDIES ON THE CORPUS LUTEUM OF GESTATION IN SHEEP

Mathai, E ; Nair, K. P. and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1978) **8**, 75-82

Gravid genitalia from 50 pregnant sheep was collected for the study of biometry, histology and histochemistry of ovary and corpus luteum during pregnancy. Different measurements and weights of ovary and corpus luteum were recorded. The right ovary was significantly more active than left. The development of follicles decreased as the stage of gestation advanced. There was greater reduction in the size and weight of corpus luteum as the gestation progressed. Degenerative changes and fibroplasia in corpus luteum progressed with gestation. Alkaline phosphatase activity also gradually reduced from first trimester to third trimester of gestation. Acid phosphatase reaction was marked during first trimester and negligible during third trimester of gestation.

## 70 STUDIES ON TESTICULAR HYPOPLASIA IN GOATS

Joseph Mathew and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1978) **9**, 24-30

Thousand pairs of testicles collected from goats slaughtered at Municipal slaughter house, Trichur were utilised for the study. There were 58 (5.8%) cases of hypoplasia, of which 56 (96.6%) were bilateral and 2 (3.4%) unilateral affecting the right testis. All the bilateral cases revealed the gross and microscopic characteristics similar to those of total hypoplasia. Unilateral hypoplasia appeared more like a developing testicle. Hence the possibility of this being a condition of late descend of testicle was suggested.

## 71 INVESTIGATION ON THE INCIDENCE OF CRYPTORCHIDISM IN GOATS

Joseph Mathew and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1978) **9**, 47-52

Out of thousand pairs of testicles examined cryptorchidism was observed in 29 cases (2.9%), 23 (79.3%) of these were unilateral and 6 (20.7%) bilateral. In unilateral cases the right testis was involved always. Of these, in 12 cases the corpus and cauda were seen detached from the testis

proper. In seven of these cases, the detached part of epididymis alone was partially descended. Microscopically the affected testicles showed varying degrees of degeneration and interstitial cell proliferation. Ectopia of the testis was observed in 4 cases (0.4%). In all these the right testis was involved. The gross and microscopic picture of the gonads resembled the cryptorchid testis.

## 72 EFFECT OF EARLY WEANING ON THE GROWTH RATE AND SURVIVAL CAPACITY OF PIGLETS

Madhavan, E. and Raja, C. K. S. V.

*Kerala J. vet. Sci.* (1978) **9**, 1--4

The study was conducted to assess how early piglets could be weaned after farrowing without affecting their growth rate and survival capacity. The piglets were weaned at 15th, 30th, 45th and 60th day and maintained on creep feed of the same composition. At 60th day the gain in weight of piglets weaned at 15th, 30th, 45th and 60th day was  $7.04 \pm 0.05$  kg.,  $9.09 \pm 0.16$  kg.,  $12.03 \pm 0.08$  kg. and  $10.14 \pm 0.17$  kg. respectively. Shortening of lactation was found to reduce the growth rate of piglets. Probably this could be improved by feeding the piglets with more palatable and highly nutritious ration. Post weaning mortality was observed only in the 15th day weaned piglets. However, the rate of mortality (4.08%) was well within the permissible limit.

## 73 EFFECT OF EARLY WEANING ON THE REPRODUCTIVE PERFORMANCE OF SOWS

Madhavan, E. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1978) **9** 186-191

Effect of weaning piglets at 15th, 30th, 45th and 60th day after farrowing, on the subsequent reproductive performance of the sows was studied. The observations made are summarised as:

1) The onset of post weaning oestrus, the conception rate, the litter size and the litter weight were not significantly altered by the age of weaning.

2) There was a significant reduction in the interfarrowing period when the weaning was done during early lactation. Hence it was inferred that weaning of piglets at 15th day of farrowing might improve the over all productivity of sows.

**74 A PRELIMINARY STUDY ON UTERO-TUBAL INSUFFLATION OF THE CAPRINE GENITALIA**

Prabhakaran Nair, K., Mathai, E. and Raja, C. K. S. V.

*Indian vet. J.* (1978) **55**, 242-244

Forty two caprine genitalia were subjected to uterotubal insufflation technique for diagnosing tubal impatency. Out of these 42 genitalia, 39 showed bilateral patency. Since the safety margin is greater the test is considered safe and reliable in the diagnosis of tubal impatency in goats.

**75 EFFICIENCY OF C. M. E. AS A DILUENT FOR THE PRESERVATION OF BUCK SEMEN AT ROOM TEMPERATURE**

Balakrishna Pillai, V., Neelakantan, C. P. and Mathai E.

*Kerala J. vet. Sci.*, (1978) **9**, 290,292

The efficacy of CME in different dilutions of 1:100 and 1:150 and 1:200 for the preservation of buck semen at room temperature was studied. It was observed, that CME could be sucessfully used for preservation of buck semen upto 24 hours of storage in all the three dilution rates. The livability of spermatozoa was superior in 1:200 dilution rate. Motility completely ceased at 48 hours of storage at all the three dilution rates.

**76 A NOTE ON COUDECTOMY IN BULL**

Prabhakaran Nair, K. and Philip, P. J.

*Kerala J. vet. Sci.*, (1978) **9**, 88-91

Semen study of a bull coudectomised is reported. Semen collection made prior to the coudectomy revealed normal semen characteristics. On the second day after the operation, only dead spermatozoa could be detected in the semen. There was total disappearance of the spermatozoa from the semen on the tenth day post operatively and as such the bull was safe enough for use as a teaser bull from 10th day onwards.



## 77 STUDIES ON THE GONADS AND HYPOPHYSIS CEREBRI OF ANOESTROUS BUFFALOES

Bharathan Namboodiripad, T. R. and Luktuke, S. N.

*Kerala J. vet. Sci.*, (1978) **9**, 293-310

The ovaries and pituitaries of anoestrous buffaloes were compared with those of normal cycling cows. The ovaries of anoestrous buffaloes weighed lesser with reduced follicular fluid content than that of cycling ones. The graffican follicles were fewer in number and smaller in size in anoestrous ones with most of them showing atresia. The pituitary of anoestrous buffaloes showed lesser content of gonadotrophic in comparison with cycling ones. The total gonadotrophic potency and F. S. H. potency were significantly lower in anoestrous buffaloes which may probably be attributed to failure of maturation and rupture of follicles in ovary and resultant failure of oestrus.

## 78 STUDIES ON THE EFFICIENCY OF INTRA-UTERINE ADMINISTRATION OF ANTIBIOTICS TO IMPROVE CONCEPTION IN COWS

Ramadas, K.; Neelakanta Iyer, C. P. and Raja, C. K. S. V

*Kerala J. vet. Sci.*, (1978) **9**, 311-314

The objective of the study was to investigate the usefulness of intra uterine antibiotic therapy at the very first breeding in bovines so as to improve the breeding efficiency. It was observed that the conception rate of animals subjected to intrauterine antibiotic therapy after insemination was significantly higher than the control group. The overall conception rate of second insemination of the animals in the treated group was found to be 70.19 percent as against 53.09 percent in the control group. This increase in conception rate at second insemination might be attributed to the fact that animals with mild infection settled more easily on continuing the therapy. It was found that the conception rate of animals treated with Dicrysticins and Mastaloneu showed no significant difference; thus conferring no advantage of one antibiotic combination over the other.

## 79 A REPORT ON GENITAL LISTERIAL INFECTION IN BUFFALOE

Bharthan Namboodiripad, T. R.; Kulshreshta, S. B. and Luktuke, S. N.

*Kerala J. vet. Sci.*, (1978) **9**, 315-319

Investigation on the bacterial cases of pathological condition of genitalia in buffalo was made from reproductive organs of buffaloes from Municipal slaughter house, Bareilly, U. P. Isolation of *Listeria monocytogenes* were made from the reproductive tract of one buffalo. The lesion showed complete encapsulation of left ovary in a saccular fluid filled bursa. Both fallopian tubes were thickened and blocked. Uterine mucosa was coated with purulent exudate. Bursal and uterine contents enabled isolation of *L. monocytogenes*. The histopathological lesions were also described.

## 80 STUDIES ON INFECTIONS IN THE GENITAL TRACT OF BUFFALOES

Bharathan Namboodiripad, T. R.; Kulshreshta, S. B.; Parihar, N. S. and Luktuke, S. N.

*Kerala J. vet. Sci.*, (1978), **9**, 320-330

Reproductive organs collected from 900 buffaloes varying in age from 3 years to 12 years slaughtered at the Municipal slaughter house, Bareilly, U. P. formed the material for the study. Infective agents from 3 cases of bursitis, 8 cases of subacute endometritis, 2 cases of chronic endometritis and 8 cases of metritis were isolated. One each of *Arizomaklebsella pneumoniae* and *L. monocytogenes* were isolated from both bursal and uterine contents from three cases of bursitis. From subacute endometritis, *C. pyogenes* was isolated from five and *Staph. aureus* *K pneumoniae* and *Arizona* from each. *Staph aureus* and *E. coli* were isolated from each of the chronic endometritis cases. In metritis *Staph aureus* from five and *C. pyogens*; *E. freundi* and *Aerobacter acromoans* from each were isolated. Microscopic lesions are also described. Drug susceptibility showed that practically all isolates were resistant to penicillin and sulphathiazol. Adequate sensitivity was also noticed to tetracycline and neomycin in all cases, and majority responded to nitrofurazone.

**81 ACID AND ALKALINE PHOSPHATASE AND AMYLASE CONCENTRATION IN THE SEMEN OF MALABARI BUCKS**

Patil, R. V. and Raja, C. K. S. V.

*Cour. Sci.*, (1978) 47 9, 318-319

The presence of acid phosphatase, alkaline phosphatase and amylase in buck semen were studied. The acid phosphatase activity varied from 30.00 to 247.50 K. A. U. with a mean of  $107.14 \pm 31.84$  K. A. U. The amylase activity of buck semen was found to vary from 96.00 to 147.20 with a mean of  $116.10 \pm 7.58$  somoggi units.

**82 EFFECT OF SEASON ON THE SEMEN CHARACTERISTICS OF MALABARI BUCKS**

Patil, R. V. and Raja, C. K. S. V.

*Indian vet. J.* (1978), 55 (10) 761-766

Sixty one semen samples from 7 Malabari bucks over a period of 1 year were studied for physical characteristics.

The mean reaction time was found to be  $49.39 \pm 2.5$  seconds. The reaction time was negatively correlated with volume, initial motility, sperm count, percentage of live sperm, percentage of abnormal sperm and positively correlated with pH. There was no significant variation in the reaction time at different seasons.

The volume of semen per ejaculate was observed to be  $0.5 \pm 0.03$  ml. There was non-significant positive correlation between volume of semen initial motility, sperm count and pH. A highly significant variation in the quantity of semen ejaculated at different seasons was also observed. The variation was brought about to the extent of 32.07% by maximum temperature, 6.09% by morning humidity.

The sperm concentration was noted to be  $3534 \times 10^6 \pm 176.1$  per ml. It had non-significant positive correlation with percentage of abnormal sperm. A highly significant seasonal variation of the sperm count was also recorded. The climatic factors that contributed for the variations were morning humidity (10.02%), evening humidity (9.82%) and hours of sunshine (12.68%).

The initial motility was in the range of 40% to 80% (mean 66.14%). The initial motility was positively correlated with sperm concentration, live sperm count and negatively correlated with pH. The variations in the initial motility during different seasons were observed to be highly significant. The minimum temperature, morning humidity and rainfall respectively accounted for 73.72%, 47.43% and 6.3% of the variations.

The live sperm was recorded to be  $63.38 \pm 2.58\%$ . There was significant positive correlation with pH of semen. Variations in the abnormal sperm count during different seasons were noted to be significant. Contribution of different climatic factors to the variations was significant.

The average pH of semen was noted to be  $6.47 \pm 0.016$ . No significant variations in pH was observed at different seasons.

### **83 HAEMATOLOGY DURING DIFFERENT PHASES IN OESTROUS CYCLE IN CROSSBRED HEIFERS**

Mathai, E. and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1979) **10**, 53-55

Haematology during different phases of oestrous cycle in seven Jersey-Sindhi heifers was carried out using blood samples collected on the 1st, 3rd, 6th, 13th and 19th day of cycle. Erythrocyte count and leucocyte count were significantly more on the day of heat. Haemoglobin, packed cell volume and erythrocyte sedimentation rate showed no significant variation during different phases of oestrous cycle. Lymphocyte count showed significant reduction during the day of heat. Neutrophils and eosinophils increased significantly on the first day of oestrous cycle. Values of basophils and monocytes did not show any significant variation during different phases of oestrous cycle.

### **84 EFFECTS OF CERTAIN GENETIC AND NON-GENETIC FACTORS ON THE SECONDARY SEX RATIO IN GOATS**

Nair, B. R. K. and Mathai, E.

*Kerala J. Vet. Sci.*, (1979) **10**, 1-8

Possible effects of the genetic group of kids, season of kiddings, litter size and the breed of the buck which sired the kids on the secondary sex ratio in goats were studied based on

the data on 750 kiddings that took place at the goat farm from 1974 to 1977. The secondary sex ratio in goats was 52:48, irrespective of the genetic groups. In Malabari, Saanen X Malabari and Alpine X Malabari kids the sex ratios were 52:48; 49:51 and 58:42 respectively. There were no significant differences between the genetic group of kids, seasons of kiddings (seasons of insemination), litter size at birth and the breed of the bucks which sired the kids on the sex ratio in goats.

#### 85 A REPORT ON QUINTUPLET BIRTH IN GOAT

Mathai, E. and Nair, B. R. K.

*Kerala J. Vet. Sci.*, (1979) 10, 324-326

A case of quintuplet birth in a local goat is reported. The parturition was normal, unaided and without any peripartum or postpartum complications.

#### 86 A PRELIMINARY REPORT ON THE EFFECT OF HONEY AS A CONSTITUENT IN EXTENDERS

Ramadas, K., Iyer, C. P. N. and Raja, C. K. S. V.

*Kerala J. Vet. Sci.*, (1979) 10, 85-88

The utility of commercially available honey as constituent of semen extender was studied. Results of the study showed that extender containing honey is superior to other diluents in preservation of motility and livability of both bull and buffalo spermatozoa. A limited study on the fertility revealed normal fertilizing ability of the diluted semen samples.

#### 87 SEASONAL VARIATIONS IN FRUCTOSE, CITRIC ACID AND ASCORBIC ACID CONTENTS OF BUFFALO SEMEN

Mohan Reddy, N. and Raja, C. K. S. V.

*Indian Vet. J.*, (1979) 56, 660-662

Forty nine pooled semen samples from 3 healthy Surti buffaloes collected over a period of 1 year were utilized for the study. The mean values of fructose, citric acid and ascorbic acid content of buffalo semen were noted to be  $426.64 \pm 10.32$  mg %,  $414.69 \pm 21.84$  mg % and  $4.10 \pm 0.08$  mg % respectively.

There was highly significant variation in level of ascorbic acid between seasons. The highest concentration of ascorbic acid was observed in samples collected during rainy season and the lowest during summer. Fructose and citric acid contents of semen were not altered due to seasonal fluctuations.

**88 SEASONAL VARIATIONS IN SODIUM, POTASSIUM, CALCIUM AND MAGNESIUM CONTENTS OF BUFFALO SEMEN**

Mohan Reddy, N. and Raja, C. K. S. V.

*Indian Vet. J.*, (1979) **56**, 928-930

A total of 49 pooled semen samples collected from 3 Surti buffaloes over a period of one year were analysed to study the seasonal variation in the level of sodium, potassium, calcium and magnesium contents.

The mean values of different constituents of semen obtained in this study were sodium  $248.93 \pm 2.17$  mg %, potassium  $202.28 \pm 2.28$  mg %, calcium  $41.11 \pm 0.17$  mg% and magnesium  $5.91 \pm 0.05$  mg %. No significant variation was observed between seasons in the levels of sodium, calcium and magnesium content of buffalo semen.

**89 DISAPPEARANCE OF SPERMATOOZOA FROM THE EJACULATE OF BULLS FOLLOWING VASECTOMY/ CAUDECTOMY**

Nair, K. P., Nair, K. N. M. and Jalaludeen, A. M.

*Indian. J. Anim. Sci.* (1979) **49**, 1009-1014

Time taken for the total disappearance of spermatozoa from the ejaculate of vasectomized/caudectomized bulls was assessed. The spermatozoa disappear totally from the ejaculate in 13 days in the vasectomized bulls and in 19 days in caudectomized bulls. The total extragonadal sperm reserve (ESR) in the vasa deferentia and ampullae was 0.76 billion in vasectomized bulls and 0.68 billion in caudectomized bulls.

**90 EFFECT OF SCROTAL INSULATION ON THE SEMEN QUALITY OF A BREEDING BULL**

Iyer, C. P. N.

*Kerala J. Vet., Sci.*, (1979) **10**, 335-336

Effects of insulation of scrotum on semen characteristics of a Swedish Red and White Bull aged  $2\frac{1}{2}$  years were studied. Following a three week pre-experimental period the scrotum was insulated and retained for 7 days. Semen collections, were continued for a period of  $3\frac{1}{2}$  months and the data obtained were analysed. Evidence of regeneration after a period of about 2 months confirm that regeneration takes much more time than degeneration.

**91 TESTICULAR DEGENERATION IN A BUFFALO BULL**  
Iyer, C. P. N. and Rajan, A.

*Kerala J. Vet. Sci.*, (1979) **10**, 301-305

A case of testicular degeneration associated with large number of abnormal sperms has been recorded in a Surti buffalo bull. Histopathological studies revealed extensive degenerative changes without any inflammatory reaction.

**92 INCIDENCE OF TESTICULAR DEGENERATION IN GOATS**  
Mathew, J. and Raja C. K. S. V.

*Kerala J. vet. Sci.* (1979) **10**, 206-211

The overall incidence of testicular degeneration in goats was 2.3%. The unilateral and bilateral cases of degeneration were observed in 6 (26.1%) and 17 (73.9%) testicles respectively. The unilateral degenerations was always associated with localised lesions. Of the bilateral cases, severe and diffuse degeneration was observed in 4 and atrophy and fibrosis in the remaining 13 organs. The gross and microscopic features of the testicles affected with degeneration have been described.

**93 OBSERVATIONS IN THE REMNANTS OF THE WOLFFIAN AND MULLERIAN DUCT SYSTEM IN BUCKS**  
Mathew, J. and Raja, C. K. S. V.

*Kerala J. vet. Sci.* (1979) **10**, 286-291.

In a study of 1000 pairs of testis and epididymis of bucks collected from the Municipal slaughter house, Trichur, 228 (25.87%) organs revealed remnants of Wolffian/Mullerian duct system. The conditions encountered were (1) Cystic persistent mesonephric tubules (8.9%) 2) Appendix epididymis (14.7%) and (3) cystic remnants of Mullerian duct (2.2%). The gross and microscopic features of the conditions have been discussed.

**94 INCIDENCE OF HERMAPHRODITISM IN PIGS**

Nair M. S. and Raja. C. K. S. V.

*Kerala J. vet., Sci.* (1979) **10**, 349-352.

The percentage of incidence of hermaphroditism in 241 pigs studied was found to be 0.41 percent. The case was

identified as male pseudohermaphroditism. The affected animal had the external appearance of gilt. The internal genitalia was totally abnormal. Absence of ovaries and fallopian tubes and intra abdominal position of the testicles were characteristic. The dome shaped anterior extremity of the body of uterus was peculiar.

**95 SEMEN CHARACTERISTICS OF YOUNG CROSS-BRED (F<sub>1</sub>) BULLS**

Rao, A. R., Mohan Reddy, N. and Rao., T. L. N.

*Indian J. vet., Sci.* (1979) **56**, 1013-1016.

The semen characteristics of 3 crossbred (F<sub>1</sub>) bulls from the age of 15 to 23 months consisting of 75 ejaculates were studied. The semen quality was poor at the beginning and improved gradually with age and was nearly normal at the age of 23 months in the cross-bred (F<sub>1</sub>) bulls studied.

**96 A NOTE ON THE COMPARATIVE EFFICACY OF DEXAMETHASONE AND STILBESTEROL IN THE TREATMENT OF MUMMIFIED FOETUS**

Nair, K. P., Sobhanan, T. P., Mathai, E. and Ramdas, K

*Kerala J. vet., Sci.* (1979) **10**, 297-300.

Comparative efficacy of Dexamethasone and stilbesterol in the treatment of mummification of foetus is reported. Dexamethasone was found to be more effective in the treatment fo advanced cases.

**97 SCHISTOSOMUS REFLEXUS IN A GOAT—  
A CASE REPORT**

Nair, K. N. M., Nair, K. P., Saradamma. T. and  
Alikutty. K, M.

*Kerala vet. J. Sci.* (1979) **10**, 346-348.

A case of schistosomus reflexus in a goat is reported. Unlike earlier reports the foetal mass did not have any resemblance to caprine foetus and there was no skin investment on the foetal mass.



**98 ADENOCARCINOMA OF VAGINA IN A COW - A CASE REPORT**

Nair, K. P., Nair S. R. and Nair, K. N. M.

*Kerala J. vet. Sci.* (1979) **10**, 342-343.

A case of adenocarcinoma of vagina in a four year old crossbred was reported. Through histological examination the neoplasm was identified as adenocarcinoma with secondary chronic vaginitis. As the neoplasm was diffuse with fairly high degree of malignancy, treatment was not attempted.

**99 BRUCELLA ABORTION—A REPORT**

Namboothiripad, S. R. B. and Nair, K. P.

*Kerala J. vet., Sci.* (1979) **10**, 327.

Investigation in wide spread abortion in cows was done. Out of 19 cows aborted within a period of 6 months one was found to be suspected of brucella infection. The study indicates the importance of prevention of brucellosis in the state.

**100 IMPERFORATE HYMEN IN A CROSS-BRED HEIFER**

Nair K. P., Nair, S. R. and Nair, K. N. M.

*Kerala J. vet., Sci.* (1979) **10**, 330-331.

A case of imperforate hymen in a crossbred heifer and its successful treatment has been reported. The heifer conceived subsequently and delivered normally.

**101 HISTOLOGICAL CHANGES OF EPIDIDYMIS DURING POST NATAL MATURITY IN PIGS**

Thomas, U. P. and Raja, C. K. S. V.

*Kerala J. vet., Sci.* (1980) **11**, 314-323

Studies were conducted on the microanatomy of the epididymis of Large White Yorkshire pigs during the postnatal growth period. Increase in the diameter of the duct and lumen-transformation of lining epithelium from simple columnar to pseudostratified type, development of the muscular investment of the duct and presence of spermatozoa at varying density were the important changes that took place during this period. Distinct regional variations with regard to structure and development were noticed even at birth. In general the growth and

development were found to be at a rapid pace in the cauda, than in the corpus and in the caput. Complete differentiation of simple columnar epithelium to pseudostratified ciliated type occurred in cauda, corpus and caput at 15 days, 105 days and 120 days of age respectively. The maximum height of epithelium in the respective regions was attained only subsequently. There was distinct regional variation in the morphology of nuclei of the pseudo-stratified ciliated epithelium. The apical nuclei in the caput were large elongated and oval. Those in the corpus were much longer and less broader and were thus cigar shaped. The apical nuclei in the cauda were similar in appearance to those in the corpus but were comparatively shorter and broader. The cilia were tallest in the caput and shortest in the cauda in adult animals. The extent of muscular investment was highest in cauda and least in corpus.

The presence of sperm in the lumen was first observed in all the three regions at 150 days of age. Subsequently sperm density increased with increase in age. There was distinct regional variations in the cauda.

## 102 POST NATAL DEVELOPMENT OF TESTIS AND EPIDIDYMIS OF LARGE WHITE YORKSHIRE BOARS

Thomas, U. P. and Raja, C. K. S. V.

*Kerala J. vet., Sci.* (1980) 11, 277-286

A systematic investigation on the postnatal development of testis and epididymis of boars was undertaken. The organs were collected by open methods of castration from 114 Large White Yorkshire Pigs in the age group varying from one day to 270 days. The pattern of testicular growth in relation to age and body weight of the animals was noted to be curvilinear. The weight of the animals was positively and significantly correlated to age and body weight of the animal. The left testis weighed more than the right in all age groups. The difference being more conspicuous and significant with increase in age. The shape of the testis remained unaltered during the growth period.

The growth pattern of epididymis was also curvilinear and followed the general trend as for the testes. The rate of growth was slower than that of the testis. Weight of the epididymis was significantly correlated to age, body weight and testicular weight of animals.

#### **103 BIOMETRY OF FEMALE GENITALIA**

Nair, M. S. and Raja, C. K. S. V.

*Kerala vet.* (1980) **11**, 287-295

Two hundred and four female pigs ranging from 4 months to 53 months of age were classified under four different age groups and the biometrics of the different organs of genitalia were taken and recorded. The effect of age and parity on the biometrics was studied. Age was found to exert a significant influence on the biometrics whereas parity did not.

#### **104 EMBRYONIC LOSS IN LARGE WHITE YORKSHIRE PIGS**

Nair M. S. and Raja, C. K. S. V.

*Kerala J. vet. Sci.* (1980) **11**, 103-106

Loss was assessed by counting the number of corpora lutea in both ovaries and comparing these with the number of viable embryos at the time of examination. Loss is calculated for two trimesters of pregnancy and six in the second trimester were examined. The extent of loss in the first trimester was found to be 20.73 per cent and that in the second 13.6 per cent.

#### **105 SEASONAL VARIATIONS IN ACID AND ALKALINE PHOSPHATASE CONTENTS IN SURTI BUFFALO BULL SEMEN**

Mohan Reddi, N. and Raja, C. K. S. V.

*Kerala J. vet. Sci.*, (1980) **11**, 48-50

A total of 49 pooled semen samples from surti buffalo bulls collected over a period of one year were analysed to study the level of acid and alkaline phosphatase. The mean value of acid and alkaline phosphatase in the semen was observed to be  $757.13 \pm 47.43$  (689.00—814.00) KAU/100ml. and  $632.32 \pm 3.04$  (600.00—684.00) KAU/100 ml. respectively. There was no significant variation in the level of enzyme between seasons.

## 106 EXTENDERS FOR PRESERVATION OF BOAR SEMEN

Vijayakumaran, V., and Iyer, C. P. N.

*Kerala J. vet. Sci.*, (1980) **11**, 215-220

An attempt was made to study the utility of six different extenders in preserving boar semen with the ultimate object of evolving a suitable extender for boar semen. Semen samples were then divided into parts and stored at 15°C and 5°C. Motility was assessed at every 12 hours upto 96 hours of storage or until total cessation of motility. Among the extenders GGEBEC, Kiew II and Kiew I diluents were found to be superior both at 15°C and 5°C to the other extenders. It was concluded that boar semen can be successfully preserved upto 60 hours in the three diluents viz., GGEBEC, Kiew I and Kiew II at 15° storage.

## 107 EFFICACY OF INTRAUTERINE ADMINISTRATION OF DEXTROSE ALONG WITH ANTIBIOTICS TO IMPROVE CONCEPTION RATE IN REPEAT BREEDING COWS

Mathew, J., Madhavan, E. and Iyer, C. P. N.

*Cheiron* (1980) **9**, 314-316

With the object of improving the conception rate in repeat breeding cows, dextrose along with antibiotics was administered intrauterine after insemination to a group of repeat breeding cows. It was revealed that such treatment significantly improved conception rate in cows.

## 108 TRUE HERMAPHRODITISM IN A PIG— A CASE REPORT

Nair, K. P., Raja, C. K. S. V. and Mathew, J.

*Kerala J. vet. Sci.* (1980) **11**, 335-339

A case of true hermaphroditism in a pig is reported. Histological study revealed that the gonads are ovotestes. The tubular genitalia were of both the sexes and the external genitalia was of an intermediary nature.

**109 A NOTE ON THE TECHNIQUE OF ENDOMETRIAL BIOPSY**

Ghosh, K. N. A., Chandramohan, V., Nair, K. P., and Namboothiripad, T. R. B.

*Kerala J. vet. Sci.*, (1980) **11**, 238-241.

The designing of a four tube model of uterine biopsy equipment and the standardization of the biopsy technique in live animals are reported.

**110 ARTIFICIAL INSEMINATION IN GOATS WITH SPECIAL REFERENCE TO THE EFFECTS OF SEASON AND PHASE OF THE MOON ON THE OESTROUS CYCLE**

Mathai, E., Nair, B. R. K., and Iyer, C. P. N.

*Kerala J. vet. Sci.* (1980) **11**, 33-41.

The conception rate in goats due to artificial insemination based on the data on 4636 AI carried out in the goat farm and AI centre for goats under field conditions was 40.86% based on kiddings or abortions. Taking into consideration the mean embryonic loss of 14.90% in goats the conception rate could be estimated as 55.76%. The AI index which is the number of insemination required/kidding or abortion was 2.45. There was no significant differences between seasons in the incidence of heat in goats. The incidence of heat on full moon days and around full moon days was 598 and that on new moon days and days around new moon days was 488. However, a significant increase in the number of does exhibiting signs of oestrus and hence inseminations were observed on full moon and new moon days indicating that the lunar phases had exerted some effect on the sexual cycle in goats. Further detailed studies on the influence of lunar phase on the cycle in goats and the probable sexual causes are envisaged under controlled conditions, to draw valid conclusions.

**111 FERTILITY OF BULL SEMEN PRESERVED IN COCONUT MILK AND EGG YOLK CITRATE DILUENTS.**

George, P. K., Iyer, C. P. N., and Mathai, E.

*Cheiron* (1681) **10**, 5.

An attempt was made to assess the fertility rate of bull semen extended in CME and EYC at different periods of storage.



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Conception rate of 42.09 percent and 49.06 percent were obtained for semen extended in CME and EYC respectively, the difference being statistically not significant. There was no significant difference between the conception rates for semen stored in CME and EYC at similar intervals.

#### 112 A REPORT ON LACTATING MALE GOATS

Nair, B. R. K., Mathai, E., and Kunjikutty, N.

*Kerala J. Vet., Sci.* (1981) 10, 145-150

Two Saanen X Malabari ( $F_1$ ) cross-bred bucks exhibited spontaneous lactation and were subjected to detailed study. They were 1 year 4 months and 1 year 3 months of age. Gynaecomastia followed by spontaneous lactation occurred around 15 months of age. Probable absence of lactenin or inactivity of lactenin was observed. Conception rate of these bucks when compared to farm data was found to be satisfactory. Apart from some differences, the milk of these bucks resembled those of the does. Blood smear showed them to be males in nuclear sex being  $60+XY$  and not  $61+XXY$ . Since the bucks under study were polled the spontaneous lactation may be the expression of polled genes. However these bucks behaved quite normally in all other respects and were used as studs.

#### 113 HAEMOGRAM OF SOWS DURING OESTROUS

Rajagopalan, P. and Raja, C. K. S. V.

*Kerala J. Vet., Sci.* (1981) 12, 235-238

Blood samples were collected on the day of heat from 17 cycling Large White Yorkshire gilts aged between 6 months to 1 year to study the cellular and bio-chemical constituents of blood during oestrus. The haematological readings of six randomly selected gilts made during the mid period of unmated oestrous cycle were recorded as the normal values for the species. The normal values and the values on the day of heat in respect of erythrocytes, haemoglobin, E. S. R., P. C. V. and total count of leucocytes were found to be respectively 5.91 million and 5.84 million/Cmm; 12.05 and 12.17%, 4.00 and 46.67 mm/hr; 40.16 and 40.17% and 14.36 and 16.92 thousands/Cmm. A significant increase in ESR and total leucocytes was observed during heat.

The percentage of neutrophils, lymphocytes, eosinophils, monocytes and basophils of normal gilts and of those during heat were noted as 36.83 and 37.29; 54.18 and 53.29; 2.66 and 6.29, 5.83 and 2.94 and 0.50 and 0.18 respectively. The oestrus in gilts was characterised by pronounced eosinophilia and monocytopenia.

#### 114 SEASONAL VARIATIONS IN SEMEN CHARACTERISTICS OF SURTI BUFFALO BULLS.

Mohan Reddi, N. and Raja, C. K. S. V.

*Kerala J. Vet., Sci.* (1981) **12**, 249-254.

One hundred and twenty four semen samples from 3 Surti buffalo bulls collected over a period of 1 year were utilised to study the physical characteristics.

The mean values of semen volume, initial motility of sperms, pH of the ejaculate, sperm concentration, live sperm count and total sperm abnormality were noted to be  $2.38 \pm 0.08$  ml (0.7 ml to 4.3ml);  $69.00 \pm 0.96$  (50 to 95%);  $6.83 \pm 0.01$  (6.7 to 7.0),  $0.86 \pm 0.01$  million/ Cm m. (0.57 to 1.18 million/Cmm),  $81.18 \pm 0.66\%$  (44.8 to 93.6%) and  $11.20 \pm 0.09\%$  (8.0 to 13.4%) respectively. The abnormalities of spermatozoan head, middle piece and tail constituted  $4.29 \pm 0.04\%$ ,  $1.18 \pm 0.03\%$  and  $3.70 \pm 0.02\%$  respectively,  $2.01 \pm 0.05\%$  of the sperms showed proximal protoplasmic droplets.

#### 115 HAEMOGRAM OF SOWS DURING PREGNANCY

Rajagopalan, P. and Raja, C. K. S. V.

*Kerala J. vet., Sci.* (1981) **12**, 239-245.

The cellular and biochemical constituents were estimated in blood samples collected from 17 healthy Large White Yorkshire gilts, aged between 7 months and 1 year at fixed intervals viz., 7th day of mating and thereafter at every 15th day till 112th day of gestation. The gestation length was divided into 3 stages as early (0-37 days), mid (38-82 days) and late (83 days to term). The blood parameters for each stage was calculated by grouping the data on the specified days falling in the respective stages of gestation.

A mild erythrocytosis during early (6.07 millions/Cmm) and mid (5.99 millions/Cmm) gestations and a significant erythropenia towards the term were recorded. Haemoglobin concentration remained unaltered except towards the last showing a significant drop (11.35gm%). The ESR was found to be very high throughout gestations.

The pregnancy in gilts was characterised by initial leucocytosis during early and mid gestation followed by leucopenia towards the end. A significant drop in lymphocyte with pronounced neutrophilia was observed during the last phase of pregnancy. The pregnancy in sows did not bring about any marked alterations in the basophils.

A significant increase in serum calcium during mid and late gestation was observed. The serum phosphate reduced during the last two stages. A significant increase in the blood iron concentration during early period and a marked reduction towards the end of pregnancy were recorded.

#### 116 EFFECT OF LUNAR PHASES ON THE ONSET OF OESTRUM IN CATTLE

Nair, K. P., Madhavan, E. and Sunny K. L.

*Indian J. Dairy Sci.* (1981) **34**, 217-219

A study was undertaken to determine the effect of lunar phases on the onset of oestrus in cattle to find out the truth behind this popular belief. Data on 7753 inseminations of cows in the artificial inseminations of the livestock farm for a period of 1975 to 1977 and 1310 inseminations of the livestock farm for a period from 1977 to 1979 formed the material for study. Analysis of data on field inseminations revealed that there is a highly significant difference ( $P < 0.01$ ) in the number of animals which exhibited oestrus on the day of full moon, on the three days of full moon and also on the three days of the new moon. On the contrary in the farm animals a significantly ( $P < 0.05$ ) higher number of animals came into heat on the days of moon. Behavioural signs of heat were more pronounced by cows which came into heat on the days of new moon and full moon. Hence it appears convincing that the new moon has more significant influence on the onset of oestrus.



**117 CORTICAL HYPERPLASIA AND OSSEOUS METAPLASIA OF THE ADRENAL IN THE BUCK**

Nair, K. P., Rajan, A. and Nair, B. R. K.

*Kerala. J. Vet. Sci.* (1981) **12**, 131-134

A case of cortical hyperplasia associated with osseous metaplasia of the adrenal in an Alpine buck has been reported. Accessory cortical nodules and moderate diffuse hyperplasia of the zona fasciculata were evident. There were isolated osseous spicules with narrow tissue in the subscapular region. The medullary cells were vacuolated and the medulla contained islands of zona fasciculata tissue.

**118 EFFECT OF AGE OF SEMEN ON CONCEPTION RATE IN GOATS**

Mathai E. and Nair B. R. K

*Kerala J. Vet., Sc.* (1981) **12**, 220-223

Based on a total of 2594 artificial inseminations conducted in goats maintained at AICRP, K. A. U. during a period of 3 years from January 1976 to December 1978 a conception rate of 40.86 percent was observed. Out of a total of 2225 inseminations done with semen stored upto 24 hours the conception rate was 42.78 percent and that in the case of 369 inseminations with semen stored beyond 24 hours the conception rate was only 29.26 percent. The decline in conception rate to the tune of 13.52 percent due to the storage of semen beyond 24 hours was found to be significant. The variations in conception rate due to difference in year, breed of buck and season were not significant.

**119 NOTE ON SODIUM AND POTASSIUM IN SEMEN OF BUCKS**

Nair, K. P., Mathai, E. and Nandakumaran, M.

*Indian J. Anim. Sci.* (1982) **52**, 608

Semen samples were collected from 16 bucks of 1-3 years age using artificial vagina. Statistical analysis to study the effect of buck on the level of sodium and potassium and the correlation coefficient between sodium and potassium were

carried out. The sodium ion concentration was 128–432 mg/100ml. ( $237.33 \pm 8.980$  mg%). The potassium level was 104–352mg/100 ml ( $239.03 \pm 7.105$  mg%). A positive correlation between the two ions existed. Analysis of variance on the effect of buck on the levels of sodium and potassium in the semen showed that there is highly significant difference ( $P < 0.01$ ).

## 120 A NEW EXTENDER FOR PRESERVATION OF BUFFALO SEMEN

Nair, K. P. and Raja, C. K. S. V

*Indian Vet. J.* (1982) 59, 716–719

Thirty eight semen samples collected from 2 surti Buffalo bulls using artificial vagina for goats were extended in egg yolk soda bicarb glucose (E. Y. S. G.), goat milk (GM), citric acid whey (CAW) and egg yolk soda bicarb glucose goat milk (EYSGM) diluents by split sample techniques. Evaluation of the motility of the spermatozoa at 24 hour intervals revealed that EYSGM was much superior to the other three diluents in prolonging the livability of sperms. The buffalo sperms maintained 48.18% motility at 96 hours of keeping. Fertility studies with semen extended in EYSGM have shown that the spermatozoa maintained good fertility in the diluent upto 96 hours.

## 121 SODIUM AND POTASSIUM CONCENTRATION IN THE SEMEN OF BULLS

Nair, K. P. and Nandakumaran, M.

*Indian J. Dairy Sci.* (1982) 35, 217

Fifty seven semen samples from one Jersey and 7 crossbred bulls were studied. The semen sample was diluted to 1 in 200 with double distilled water. Estimation was done using Flame photometry. The sodium and potassium level was found to be  $247.649 \pm 5.401$  and  $164.140 \pm 8.631$  mg/100ml respectively. The sodium-potassium ratio was found to be 1:0.66. A highly significant positive correlation between the levels of sodium and potassium in bull semen was seen ( $P < 0.01$ ). Sodium and potassium were significantly higher in Jersey bull semen than the cross-bred bull semen.

**122 NOTE ON SPERM MORPHOLOGY IN DIFFERENT REGIONS OF EPIDIDYMIS IN BUCKS**

Mathai, E., Iyer, C. P. N and Nair, K. P.

*Indian J. Anim. Sci.* (1982) **52**, 110-112

Epididymes of both the sides were collected from 8 Saanen x Malabari F<sub>1</sub> bucks within an age of 1-2 years soon after slaughter. Semen was collected by micropuncture from the efferent tubules, caput, corpus and cauda epididymis. Sperm head abnormalities decreased progressively during its passage through the epididymis. The pattern of incidence of sperm tail abnormalities was in sharp contrast and showed an increasing trend. As the semen was taken from only four regions of the epididymis as such it is not possible to pinpoint the segment of the caput where a sharp decrease in the proximal protoplasmic droplets occurred.

**123 RE-ESTABLISHMENT OF NORMAL SEMEN PICTURE IN A CAUDECTOMIZED BUCK**

Mathew, J. and Nair, K. P.

*Indian J. Anim. Sci.* (1983) **53**, 344-345

A Malabari buck aged 3 years was caudectomized into a teaser. Semen collection at regular intervals post operatively was not possible due to poor libido. First semen collection 2 months later showed a steady and progressive improvement in the density, mass activity, motility and sperm cell concentration with a drop in percentage of dead and abnormal sperms. A second caudectomy 5 months later was carried out. After the first operation total depletion of sperms even 2 months later did not occur. However, total depletion occurred 52 days after the second operation.

**124 PATHOLOGY OF THE UTERUS IN REPEAT BREEDER COWS**

Ghosh, K. N. A., Namboothiripad, T. R. B., Nair, K.P. and Iyer, C. P. N.

*Kerala. J. vet. Sci.*, (1983) **14**, 77-82

Pathological lesions in the uterine biopsy materials from 26 repeat breeder cows were described. The pathological conditions encountered were endometritis (69.2%), cystic dialation of the endometrial glands (11.5%) and periglandular fibrosis (15.3%). Depending on the severity of the lesion

the animals were broadly classified into three groups and the conception rate studied. While in group-I (Mild type) and group-II (Moderate) 58.3% and 25% conception respectively was obtained none of the animals in group-III (severe type) conceived.

#### 125 OVARIAN HYPOPLASIA IN BROWN SWISS CROSS-BRED CATTLE

Mathew, J., Nair, K. P., and Raja, C. K. S. V.

*Trop. Vet. Anim. Sci. Res.* (1983) **1**, 249-250

The incidence of ovarian hypoplasia during a routine investigation on cattle infertility in a Brown Swiss cross breeding area has been reported. Animals (1017 heifers and 83 cows) above three years of age with small bean shaped or spindle shaped ovaries were diagnosed as cases of ovarian hypoplasia. None of the 83 cows were affected. Of 930 heifers with 50% exotic inheritance 24 (2.58%) had ovarian hypoplasia, 87 heifers with 62.5% exotic inheritance 8(9.2%) were affected. Higher incidence in left ovary than right was observed. All 32 affected animals had a uniformly brown coat. Average size of ovaries was 1.75 x 0.65 x 0.34 cm with neither follicle nor luteal scars. The high incidence recorded in this case has been attributed to it having been carried out on a Brown Swiss crossbred population where high incidence of delayed puberty has been reported.

#### 126 UTERO-TUBAL INSUFFLATION TECHNIQUE

##### (III) DIAGNOSIS AND TREATMENT OF TUBAL IMPATENCY REPEAT BREEDER COWS

Athman, K. V., Iyer., C. P. N. and Nair, K. P.

*Indian J. Anim. Reprod.* (1983) **4**, 30-33.

Thirty five repeat breeder cows and two repeat breeder heifers were subjected to utero-tubal insufflation test using an equipment designed by the authors. The incidence of unilateral and bilateral impatency of the salpinx in cows were 2.85 percent and 14.28 percent respectively. However both the heifers were found to have bilaterally patent salpinx. The test showed that the safety margin is fairly high and hence uterotubal insufflation test is of great diagnostic value in bovines. Since 69.56 percent cows with bilaterally patent salpinx on testing conceived with an average of 1.13 inseminations the test is considered to be of therapeutic value in clearing temporary tubal blockage.

## 127 CERTAIN REPRODUCTIVE TRAITS OF CROSSBRED COWS

Madhavan, E., Nair, K. P., Ravindranathan, N. and Devassia, P. A.

*Indian J. Anim. Reprod.* (1983) 4, 71-74.

Reproductive traits of 162 Jersey, 40 Brown Swiss and 17 Holstein cross-bred cows belonging to the Livestock Farm, K. A. U. were studied. Post partum oestrus interval, number of A. I. per conception, gestation period, inter calving period and weight of calf at birth did not vary significantly between different genetic groups. Parity of cows did not influence the gestation length. Number of inseminations per conception was significantly higher in abnormal calving. Post insemination antibiotic therapy in repeaters significantly reduced the number of insemination per conception and intercalving period.

## 128 VARICOSITY OF CERVICAL VEINS IN A COW

Ghosh, K. N. A. and Nair K. P.

*Indian J. Anim. Reprod.* (1984) 5, 117-118.

A case of varicosity of cervical veins in a cow was treated surgically. A 5cm long, cylindrical growth with a reddish tip was seen to be projecting out of the vulval lips of an eight year old pluriparous cow. The mass was surgically removed and subjected to biopsy. Histopathological picture showed markedly dilated veins embedded in a fibrous tissue stroma. The cord like protrusion of the mass, the presence of thrombosed vessels on gross examination and mature veins with hyperplastic wall filled with blood suggest varicosity of the veins.

## 129 PRESERVATION OF BUCK SEMEN IN TRIS YOLK DILUENT

Mathew, J., Raja, C. K. S. V. and Nair, K. P.

*Indian Vet. J.* (1984) 61, 964-968.

For standardising the Tris yolk diluent for preservation of buck semen, 18 combinations of 0.2M Tris diluent with 6 varying levels of egg yolk at 3 pH levels were tried. Pooled semen was diluted at 1:10 dilution rate. The preservation was carried out in two storage temperature viz., 3-5°C and 6-8°C in order to find the optimum storage temperature. Diluents containing

20 and 25% egg yolk were found to be superior for the preservation of spermatozoa at 3-5°C. But no difference between pH levels could be discerned at the above storage temperature. Tris diluent with 5% egg yolk with pH 7 was found to be superior for the preservation of buck semen at 6-8°C.

### 130 SPERM AKINESIA IN A JERSEY BULL

Nair, K. P.

*Kerala J. Vet., Sci.* (1984) **15**, 161-168.

A hereditary sperm akinesia similar to dag defect with nearly 70% sperm showing bent and coiled tails in an imported Jersey bull was reported and sperm abnormalities in the different regions of epididymis were also described.

### 131 DAILY SPERM PRODUCTION OF BROWN SWISS CROSS-BRED BULLS

Nair, K. P. and Vardarajan, M.

*Kerala J. Vet., Sci.* (1985) **16**, 21-26

Daily sperm production has been estimated in young Brown Swiss cross-bred bulls by depletion studies. The daily sperm production (DSP) was recorded to be  $2827.444 \times 10^6$ , which is much lower than the reported values for exotic bulls. The comparatively young age of the bulls coupled with lower percentage of exotic inheritance might be responsible for the low DSP. The higher percentage rejection of crossbred bulls of lower exotic inheritance might be due to low DSP and poor semen quality.

### 132 RECENT TRENDS IN OESTROUS CYCLE OF ALPINE-MALABARI GOATS IN KERALA

Mathai, E.

Paper presented at ISSAR symposium held at Guwahati—1986

In Alpine-Malabari-crossbred goats the age of onset of puberty was observed to be  $232.40 \pm 6.271$  days. The length of oestrus cycle was 21.174 days. There was no significant variation in length of oestrous cycle between animals however it suggested a less variation in cycle length in the prevailing

tropical and managerial conditions. No significant difference in weight of ovaries could be seen. Examination after slaughter revealed that change from medium sized to large follicles is comparatively quicker occurring even during the pro-oestrus period. Small sized follicles were present throughout the length of oestrous cycle.

Haematological study revealed PCV to be more on the days of oestrus. Total leukocyte count was more during oestrus and pro-oestrus. Lymphocytes were significantly low, neutrophils and eosinophils were more on the day of oestrus.

### 133 BUFFALO SEMINAL ANTIBODIES—ITS DETECTION AND TITRATION BY GELATIN AGGLUTINATION AND TUBE SLIDE AGGLUTINATION TESTS

Sudarsanan, V., Pattabiraman, S. R. Venkitesami, V.

*Indian J. Anim. Res.* (1986) 7, 9-13

Female albino rabbits were immunized against buffalo semen, seminal plasma and washed spermatozoa. Elicitation of immune response one week after the subcutaneous injection of the antigen was detected and the antibody titre was assayed by GAT and TSAT. Subsequent build-up of titre following each weekly injection was also assayed by the same tests. The tests were found to be reliable and repeatable for detection and titration of rabbit anti-buffalo seminal serum.

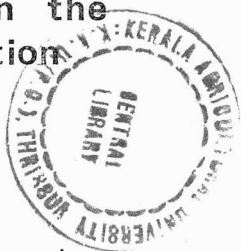
### 134 AGALACTIA IN AN ELEPHANT—A CASE REPORT

Ghosh, K. N. A. and Nair, K. P.

*Indian J. Anim. Reprod.* (1987) 8:1: 74-75

A study was made on a case of agalactia in an elephant which was treated successfully with Leptaden (Vet) tablets. A captive elephant 30 years old showed post-partum changes in udder. The mammary gland and the teats were very hard with little colostrum. Three days after calving the elephant was treated with a galactagogue—Leptaden (Vet) tabs at a dose of 50 tabs twice daily for visible days. Sixth day following administration enlargement in size of mammary glands—teats with softening of tissue was seen. Sufficient milk in udder could be seen by 20th days of treatment. The dose was reduced to 30 tablets twice daily and continued for another month.

## Summary of thesis work done in the Department of Animal Reproduction



### 1 PREGNANCY DIAGNOSIS IN GOATS

Sudarsanan, V.

*Thesis (M. Sc.), 1970*

A detailed investigation on the usefulness of the various biological and chemical tests for diagnosing pregnancy in goats was undertaken.

Immature rat test using blood serum was found to be of supplementary value in diagnosing early pregnancy in goats. Among the chemical tests, modified cuboni test unlike the green fluorescence with the mare urine, developed two distinct colours with goat urine viz., greenish yellow, brown and greenish yellow appeared to be more characteristic of pregnancy.

The cervical mucus test was observed to be a reliable method for diagnosing early pregnancy in goats.

### 2 STUDIES ON GOAT SEMEN

Patel, R. V.

*Thesis (M. Sc.), 1970*

Sixty seven semen samples from 7 Malabari bucks of 1 to 3½ years of age were studied. The physical characteristics such as volume, colour density and concentration of sperm, initial motility, MBR test, live sperm percent, abnormal sperm percent etc., were studied in detail. In addition, the cyto-metrical values of the goat sperms were recorded. The biochemical constituents of buck semen such as dry weight, total protein, total cholesterol, N. P. N., urea etc. and sodium, calcium, magnesium chloride, inorganic phosphates, fructose, citric acid and ascorbic acid were analysed.

### 3 STUDIES ON PORCINE GENITALIA

Sthanumalayan Nair, M.

*Thesis (M. Sc.), 1970*

A detailed investigation on the biometry, histology, histochemistry and histopathology of female porcine genitalia



was undertaken collecting the organs from 241 yorkshire pigs of known breeding history. Abnormalities of the tubular tract noted were (1) Vaginitis (2/241). (2) Cervicitis—1.24%, (3) Squamous metaplasia of cervix 2.84%, (4) Endometritis—5.31%, (5) Metritis—1.64% (6) Perimetritis—5/241 (7) Parametritis—1/241, (8) Cystic glandular hyperplasia of uterus—5%, (9) Adenomyosis of uterus—1/241, (10) Haematocyst of uterus—0.41%, (11) Muscular dystrophy of uterus—2.44% (12) Hydrometra—0.83%, (13) Oedema of uterus—3.7%, (14) Hydrosalpinx—4.56%, (15) Salpingitis—5%, (16) Pyosalpinx—1/241 and (17) Parovarian cyst 23/241. Ovarian pathology encountered were cystic ovary—8.26% and hypoplasia—2.19%, Atretic follicles—37/241, Bursal adhesion—5.39%, Oophoritis. Follicular haemorrhage and thrombosis each—0.82, Arteriosclerosis—1.76% and lymphogectiasis—3.25. In addition, one case of male pseudo hermaphroditism was also met with and studied in detail. A limited study on gravid genitalia revealed the occurrence of embryonic loss to the extent of 20.73% in the first trimester and 13.67 in the second trimester.

#### 4 INVESTIGATIONS ON THE INCIDENCE, NATURE AND MAGNITUDE OF PREVALENCE OF REPEAT BREEDING IN CATTLE WITH SPECIAL REFERENCE TO INFECTIVE AGENTS

Bharathan Namboodiripad, T. R.

*Thesis (M. Sc.) 1971*

A detailed investigation on the incidence, nature and magnitude of prevalence of repeat breeding in cattle with special reference to uterine infection was undertaken.

The overall incidence of repeat breeding in Sindhi and cross bred animals was found to be 18.58% and 11.11% respectively.

The incidence of repeat breeding was found to increase with parity. Repeat breeding was not essentially a repeatable character. Among the causes of repeat breeding uterine infection with specific and non-specific bacteria was predominant (73.13%). Ovulatory disturbances such as an ovulation and delayed ovulation occurred in 21.95%, pathological causes of salpinx and bursa was present in 49% cases.

Among the specific infection prevalence of vibriosis alone was detected. Physical characteristics of oestral mucus of repeaters was to be different in many respects from that of normal cows.

Intrauterine therapy with antibiotics selected on the basis of sensitivity tests was found to be very useful for treating repeaters.

## 5 REPRODUCTORY RESPONSE OF JERSEY—SINDHI FEMALES UNDER DIFFERENT CLIMATIC CONDITIONS

Mathai, E.

*Thesis (M. Sc.), 1971*

An investigation was carried out using 21 Jersey—Sindhi female calves of the livestock farm, attached to Kerala Veterinary College and Research Institute to determine birth weight, rate of growth, age and weight at puberty. Birth weight of Jersey—Sindhi female calves was found to vary from 19.5 kg to 21.5 kg with a mean of  $20.2 \pm 0.48$ . The calves maintained on low, medium and high levels of feeding were observed to have average daily gain in weight of 0.201 kg, 0.2571 kg and 0.333 kg respectively. Birth weight of the calf significantly influenced its weight at weaning. Calves fed on low, medium and high levels of ration attained maturity at  $612.0 \pm 3.19$  days,  $527.8 \pm 9.401$  days and  $484.7 \pm 5.015$  days respectively. The average weight at puberty at the above order was  $143.3 \pm 0.943$  kg,  $155.8 \pm 0.445$  kg and  $164.8 \pm 3.357$  kg. Age, weight and body measurements of animals at puberty were significantly influenced by the level of feeding.

Seventy two 0 cycles in 9 Jersey—Sindhi heifers were studied in detail. The length of 0 cycles ranged from 15.33 to 20.66 days with a mean of  $20.71 \pm 0.198$  days. During summer, rainy and winter seasons the average cycle length were observed to be 21.01 days, 20.77 days and 20.28 days respectively. The length of 0 cycles was not affected by season. The duration of oestrus ranged from 4 to 32 hours with a mean of  $17.77 \pm 0.856$  hours. The average length of oestrus during summer, rainy and winter season were noted to be 12.2 hours, 19.0 hours and 19.7 hours respectively. A significant

reduction in the duration of heat was noted during summer. Ovulation was found to occur at 2.39 hours after the end of heat. The ovulation time was not affected by the seasonal variation. The percentage anovulation was observed to be 9.7. From the right ovary 69.42% of ovulations occurred. An incidence of 2.77% metoestrous bleeding was noted. During the day of heat there was significant increase in R B. C., W. B. C., percentage of eosinophils, whereas the percentage of lymphocyte showed a significant reduction.

## 6 HAEMATOLOGICAL STUDIES OF SOWS DURING PREGNANCY

Rajagopalan

*Thesis (M. Sc.), 1972*

The haemogram and haematological constituents of 17 gilts were studied on the day of mating and on 7th, 22nd, 35th, 52nd, 65th, 82nd, 97th and 112th days of gestation. These values after grouping into 3 trimesters of pregnancy were compared with values for non-pregnant sows. Early and mid gestation showed anemia due to both lower erythrocyte count and haemoglobin concentration. Period of gestation consistently showed increased ESR. Leucocytic picture showed initial leucocytosis followed by leucopenia towards end. Marked neutrophilia and lymphopenia was also manifested during late gestation. Among biochemical constituents in blood level of calcium increased gradually during gestation while level of phosphorus declined. Though Mg concentration is unaffected, iron content increased during early pregnancy and declined towards last. The study also revealed that oestrus in sows was characterised by significant eosinophilia and increased ESR.

## 7 INVESTIGATIONS ON THE INCIDENCE OF VARIOUS PATHOLOGICAL CONDITIONS IN THE GENITALIA OF COWS

Prabhakaran Nair, K.

*Thesis (M. Sc.), 1973*

One thousand two hundred and fifty genitalia of non-descript cows inclusive of 250 gravid ones, collected from

Municipal slaughter house, Trichur were subjected to detailed gross and histopathological studies.

Out of the 1250 genitalia examined, 239 (19.12%) revealed various pathological lesions.

The pathological conditions observed in the ovaries were hypoplasia (0.08%), cystic graaffian follicle (1.44%), cystic corpus luteum (0.80%), chronic suppurative oophoritis (0.48%), haematoma (0.48%), infantile ovaries (0.16%), inactive ovaries (2.24%), senile atrophy (0.80%), and fibropapillary growths (0.08%).

The conditions affecting the salpinx, bursa and broad ligaments were salpingitis (0.24%), cyst in the salpinx (0.32%), hydrosalpinx (0.16%), papillary hyperplasia (0.88%), chronic bursitis (2.0%), hydrops bursa (0.16%), parovarian cyst (0.32%), parovarian abscess (0.16%), and zenker's degeneration of the broad ligament (0.08%). The lesions observed in the uterus were hydrometra (0.24%), mummified foetus (0.08%), cystic glandular hyperplasia (0.40%), cyst in the uterus (0.32%), adenomyosis (0.16%), senile atrophy (2.16%), subepithelial haemorrhage (0.24%), metritis (0.16%), endometritis (0.80%), perimetritis (0.16%), adenomatous endometrial hyperplasia (0.08%), capillary angioma (0.16%) and fibroadenoma (0.08%).

The cervix was found to be affected with cervicitis (0.56%), Nabothian cyst (0.24%), Pericervical abscess (0.16%) and Haemosiderosis (0.08%).

Thirty seven genitalia revealed pathological conditions in the vagina and vulva. The conditions recorded were cystic gartner's duct (0.32%), vaginitis (0.16%), granular vulvo vaginitis (2.4%) and squamous cell carcinoma (0.08%).

## 8 STUDIES ON THE EFFECT OF VITAMIN A DEFICIENCY ON THE SEXUAL ORGANS OF BOARS.

Appa Rao, B. C.

*Thesis (M. Sc), 1973*

In order to elucidate the effect of avitaminosis A on the growth and function of sexual organs of boars, an investigation was carried out using 20 weaned piglets of Middle Yorkshire

breed. Six piglets were maintained on standard ration, while the remaining 14 were put on a specially computed Vitamin A deficient ration. The experimental animals were slaughtered at regular intervals from the time of appearance of clinical symptoms of avitaminosis A. Few boars were then supplemented with vitamin A for 15-45 days to study the regeneration of the germinal epithelium of the testis. The following observations were made:

- a) The growth rate was not affected by Vitamin A deficiency.
- b) The skin lesions characterized by loss of glossiness and luster of hair coat was the first symptom observed in avitaminosis A. This was observed in about 5½ months of deficient feeding. In later stages the animals showed numerous brownish greasy crusts all over the body. In advanced stages of deficiency, the pigs appeared lethargic and exhausted and showed recurrent convulsive attacks.
- c) The testicular weight in avitaminosis A was markedly reduced. In addition progressive degeneration of seminiferous tubules was set in within 5½ months of deficient feeding and completed within 9 months.
- d) Epididymis of the deficient boar revealed significant reduction in size. Structural alteration characterized by metaplasia of epithelial lining of the duct was noted only in advanced stage of deficiency.
- e) Pathological changes in the secondary sex organs were not pronounced
- f) Supplementation of Vitamin A was found to have quick and marked effect in alleviating the clinical symptoms.
- g) Regeneration of testicular tissue was initiated within 15 days of supplementation. Within 45 days, testicles appeared completely regenerated and normal. However, when the deficient feeding was prolonged for 285 days, Vitamin A supplementation for a period of 45 days did not bring about complete regeneration.

## 9 INVESTIGATION ON THE INFLUENCE OF SEASON ON THE PHYSICO CHEMICAL CHARACTERISTICS OF SEMEN IN SURTI BUFFALO BULLS.

Mohan Reddy, C.

*Thesis (M Sc.), 1973*

124 semen samples collected from 3 Surti buffaloes during the period of one year from January to December 1972 were analysed to study the physical characteristics, and biochemical characteristics using 49 pooled samples.

The mean values obtained in respect of the various physical and biochemical characteristics were comparable to those reported in the literature by earlier workers. Of the physical characteristics, sperm abnormality alone was found to be significantly affected by seasonal changes. The lowest number of abnormal sperms was noted during rainy season, while the highest percentage was seen in summer.

The ascorbic acid, chloride and acid soluble phosphate content of semen were found to vary significantly between seasons. The highest concentration of ascorbic acid was observed during rainy season and lowest in summer. On the other hand semen samples obtained during summer had the highest concentration of chloride and acid soluble phosphate.

## 10 DEVELOPMENT AND STRUCTURE OF TESTIS AND EPIDIDYMIS IN RELATION TO ONSET OF SEXUAL MATURITY

Thomas, U. P.

*Thesis (M Sc) 1973*

A systematic investigation on the post-natal growth and development of testis and epididymis of boars in relation to sexual maturity was carried out using 114 pairs of testis epididymis collected from Large White Yorkshire boars. The experimental animals were in the age group of 0-270 days. Results and observation were discussed in three different chapters. In the first chapter, the postnatal growth of testis and epididymis was dealt. The microanatomy of the organs was discussed in the chapters II and III.

## 11 STUDIES ON BOAR SEMEN

Sreekumaran, T

Thesis (M. Sc.) 1974

Fifty four semen samples collected in A. V. from 9 White yorkshire boars aged 12-18 months were examined for the physical and biochemical characteristics.

The mean value observed in respect of the physical characteristics of boar semen were: Total volume ( $165.85 \pm 23.11$  MI), Gel free volume ( $114.25 \pm 16.03$  MI); Motility ( $65.75 \pm 9.11$ ); pH ( $7.61 \pm 1.04$ ); sperm count ( $2.50 \pm 0.39$  lakhs per cmm.); Live sperm count; ( $88.80 \pm 0.51\%$ ); distal protoplasmic droplets  $2.96 \pm 0.48\%$ ; Abnormal sperm ( $7.33 \pm 1.11\%$ ) Proximal protoplasmic droplets ( $2.84 \pm 0.51\%$ ); incubation time ( $34.07 \pm 5.05$  minutes). A significant variation between boars were observed in total volume, gelfree volume, motility, live sperm count, abnormality of sperm, and sperm with protoplasmic droplet. For the biochemical characteristics, the mean values obtained were fructose  $17.26 \pm 2.69$  mg%), citric acid ( $153.56 \pm 2.69$  mg%), ascorbic acid ( $3.56 \pm 0.53$ mg%), total protein ( $4.11 \pm 0.578\%$ ) nonprotein nitrogen ( $21.90 \pm 3.06$  mg%), creatinine ( $1.24 \pm 0.18$  mg%), sodium ( $466.23 \pm 67.53$ mg%), potassium ( $202.7 \pm 28.84$ mg%) calcium ( $7.49 \pm 1.08$  mg%), Magnesium  $7.49 \pm 1.34$  mg%), Chloride ( $377.03 \pm 51.13$  mg), Inorganic phosphorus ( $4.22 \pm 0.61$  mg%), Acid soluble phosphorus ( $28.56 \pm 4.19$  mg%), Ester phosphorus ( $24.22 \pm 3.64$ mg%), Lipid phosphorus  $16.00 \pm 2.55$ mg%).

A significant variation between boars were observed in the level of fructose, ascorbic acid, calcium, magnesium and chloride.

## 12 STUDIES ON THE PATHOLOGY OF TESTIS AND EPIDIDYMIS OF BUCKS

Joseph Mathew

Thesis (M. V. Sc), 1976

Infertility or sterility in bucks are almost always caused by testicular or epididymal affections. Hence a study on the pathological conditions of these organs might give an approximate idea of the nature and prevalence of sterility conditions in male goats. The present study was taken up with this object in view.

Thousand pairs of testicles and epididymis of bucks, aged 6 to 18 months were collected at random from the abattoir and examined. The organs which revealed gross lesions and those which were suspected to be affected were subjected to detailed histopathological studies.

Out of the thousand pairs of organs examined, 174 (17.4%) revealed various pathological lesions. The following pathological conditions were observed during the course of the present study: Testicular hypoplasia (5.8%), Cryptorchidism (2.9%) Ectopic testis (0.4%), Testicular degeneration (0.4%), Adhesion with tunics (1.8%) Testicular atrophy (1.3%), Testicular haemorrhage (0.1%), Male pseudo hermaphroditism (0.1%) Spermiostasis (11.%), Spermatocytic granuloma (0.1%), Epididymal haemorrhage (0.4%), Epididymal melanosis (4.3%).

In addition, 258 (25.8%) organs showed minor developmental aberrations such as cystic persistent mesonephric tubules (8.9%) appendix epididymis (14.7%) and cystic remnants of Mullerian duct (2.2%).

### 13 EFFECT OF EARLY WEANING ON THE REPRODUCTIVE PERFORMANCE OF SOWS.

Madhavan, E.

*Thesis (M. V. Sc.), 1977*

The effects of weaning piglets on 15th, 30th, 45th, and 60th day on the reproductive performance of sows and the growth and survival capacity of piglets were studied. There was no significant difference in the onset of post weaning heat, conception rate, litter size and litter weight of piglets. But at the same time the farrowing interval could be significantly reduced by early weaning. The growth rate of piglets was found to be considerably reduced by early weaning but survival capacity of piglets was not affected by early weaning. Probably the low gain in weight of early weaned piglets could be improved by feeding them with creep feed of superior quality. To sum up, it was observed that weaning of piglets at 15th day of farrowing would be of advantage for the overall increase in the productivity of swine.



#### 14 STUDIES ON THE PRESERVATION OF BOAR SEMEN IN VARIOUS EXTENDERS

Vijayakumaran, V

*Thesis (M. V. Sc ) 1977*

With the ultimate object of evolving a suitable extender for boar semen, 72 ejaculates from six boars selected at random from University Pig Breeding Farm, Mannuthy were used for the preservation studies.

Thirteen extenders were originally used for the study viz whole milk extender (WME), citric acid whey diluent (CAW) Egg yolk citrate diluent (EYC), Egg yolk glucose citrate diluent (EYGC), Egg yolk glucose glycine citrate diluent (EYGGC), Egg yolk glucose sodium bicarbonate diluent (EYGB), Egg yolk glucose sodium bicarbonate milk diluent (EYGBM), Illini variable temperature diluent (IVT), Kiew or Varohm diluent, (Kiew-1) Kiew or varohm diluent-11 (Kiew-11) and Glucose glycine EDTA bicarbonate citrate diluent (GGEBC).

During the course of the experiment seven extenders viz WME, CAW, EYG, EYGC, EYGGC, EYGB and EYGBM were eliminated from further studies due to poor preservability. The other six diluents were used to study the keeping quality of boar semen at two temperatures of progressively motile sperms were observed in glucose glycine EDTA bicarbonate citrate, Kiew-11 and Kiew-1 extenders. At 15°C semen could be stored in these extenders upto 60 hours with good motility. Coconut milk extender proved to be least suitable for the preservation of boar semen both at 15°C and 5°C of storage. Progressive motility in all the diluents was higher at 15°C than at 5°C.

#### 15 FERTILITY STUDIES OF SEMEN PRESERVED IN COCONUT MILK EXTENDER

George, P. K.

*Thesis (M.V.Sc.), 1978*

The object of the study was to assess the fertility of semen extended in CME at various periods of storage in comparison with semen extended in EYC. Semen samples collected from three breeding bulls maintained at the Artificial Insemination centre, Mannuthy were diluted with CME

and EYC using split sample technique and stored at room temperature and at 5°C respectively. Both the samples were preserved upto 96 hours and utilized for the study. A total number of 1112 animals were utilized for the fertility evaluation. Alternate animals were inseminated with semen extended in CME or EYC. Conception rates were estimated on the basis of rectal examination.

The overall conception rate did not vary significantly between CME (42.09%) and EYC (49.06%). The conception rate in cows was significantly higher than in heifers both in CME (43.73% and 38%) and EYC (50.3% and 45.56%).

The conception rate with CME semen at 24, 48, 72 and 96 hours were 47.36, 47.25, 33.92 and 26.66 respectively and that with EYC semen were 56.22, 50.48, 40.67 and 29.54 respectively. Within the same period of storage, conception rate between CME and EYC was not found significant. In conclusion, it may be stated that semen preserved in CME can be used upto 72 hours of storage time without substantial reduction in the fertility.

## 16 STUDIES ON ADMINISTRATION OF INTRA-UTERINE ADMINISTRATION OF ANTIBIOTICS TO IMPROVE BREEDING EFFICIENCY IN COWS

Ramadas, K.

*Thesis (M. V. Sc.), 1978*

The object of the study was to investigate the usefulness of intra-uterine antibiotic therapy at the very first breeding in bovines so as to improve the chances of conception. The experiment was conducted on animals brought for insemination at the Artificial Insemination Centre, Trichur attached to the Kerala Agricultural University. The animals were divided into two experimental groups and one control group. The first group of 166 cows and 56 heifers was given one vial each of Dicrysticin-s in 30 ml of distilled water. The second group of 47 cows and 31 heifers was treated with Mastalone-U in the same way. The control group of 300 animals did not receive any treatment either before or after insemination. The conception rates of animals treated with antibiotics was significantly

higher than in control group. Dicrysticin-S and Mastalone-U did not show any specific advantage over the other in improving the conception rate. The rate of conception increased on repeating the therapy of subsequent heat. The overall conception rate in heifers was significantly lower than that in cows. Also the conception rate in dry animals was lower than that of lactating cows. To sum up it may be stated that antibiotic infusion of uterus in 24 hour after insemination could be considered as routine measure for overall improvement in breeding efficiency of cows.

## 17 STUDIES ON UTERINE PATHOLOGY IN REPEAT BREEDING CATTLE

Ghosh, K. N. A.

*Thesis (M. V. Sc.), 1979*

Object of the study was to investigate on the uterine pathology in repeat breeding cows employing uterine biopsy as a diagnostic technique. The biopsy was taken using a biopsy instrument which was a modification of one designed by Minocha *et al* (1964). Biopsy was taken from 26 repeat breeding cows in early part of heat keeping 4 normal cows as control. The animals were inseminated 8-12 hours after biopsy followed by intra uterine antibiotic therapy after 12-24 hours. The animals which failed to conceive after biopsy and treatment were slaughtered and their genitalia were subjected to detailed studies.

Percentage of conception in repeat breeders and in control animals indicated that biopsy operations did not affect the functional status of the uterus. In 53.85% of the repeat breeders, pathological changes in the endometrium were observed, which include infiltration with various types of inflammatory cells, periglandular fibrosis, cystic dilatation of glands, glandular hypertrophy, stromal hyalinization and sclerosis. Endometritis was the most important lesion observed.

The animals which showed normal or nearly normal endometrium and those showed more extensive inflammatory changes had a conception rate of 58.33% and 25% respectively. Those animals with severe inflammation and fibrosis of endometrium did not conceive. The lesions in the slaughtered animals correlated with the biopsy findings.

## 18. STUDIES ON THE PRESERVATION OF BUCK SEMEN

Balakrishnan, P. P.

*Thesis (M. V. Sc.) 1979*

With the ultimate subject of evolving a suitable extender for semen, 64 ejaculates from eight healthy cross-bred bucks (6 Saanen and Malabari and 2 Alpine and Malabari) were used for the preservation studies. Six diluents viz. Tris, skim milk citrate fructose glycine (SMCFG), Milk citrate fructose glycine (MCFG), whole cow milk (CM), whole goat milk (GM) and Cornell University extender (CUE) were stored at 5°C and coconut milk extender (CME) at room temperature. Buck semen could be stored upto 60 hours in Tris, SMCFG and MCFG with good motility at 5°C. In CME, semen could be stored only upto 24 hours in 1:200 dilution. Egg yolk containing diluents proved to be least suitable for preservation of buck semen at 5°C. The percentage of conception rate was 44.0, 52.0 and 53.3 with Tris, SMCFG and MCFG diluents respectively.

## 19. STUDIES ON POST PARTUM OESTRUM IN CROSS-BRED COWS

Nair, S. P. S.

*Thesis (M. V. Sc.), 1979.*

The object of the study was to find out the various reproductive parameters that influence the onset of post-partum oestrus in cross-bred cows. Hundred and fifteen cross-bred cows of Jersey and Sindhi and Jersey and local breeds were grouped into normal and abnormal calvers based on the normality of calving.

There were significant variations in the cessation of lochial discharge, regression of pregnancy corpus luteum, period of uterine and vulval involution, onset of first and second ovulations and postpartum oestrus interval between normal and abnormal parturitions. Season of calving had a significant influence on the duration of lochial discharge, regression of pregnancy corpus luteum and onset of first ovulation. Parity of cow was found to influence the period of lochia, involutions of uterus and also the post-partum oestrus interval. Milk yield of the cow significantly influenced regression of pregnancy corpus luteum and vulval involution. An incidence of 13.4% of aberrations of oestrus was also observed.

## 20 INVESTIGATION ON THE PATHOLOGICAL CONDITIONS IN THE GENITALIA OF FEMALE GOATS

Ramachandran, K.

*Thesis (M. V. Sc.) 1980.*

The object of the study was to assess the incidence and nature of pathological conditions affecting the genitalia of both pregnant and non-pregnant goats. Out of the 950 genitalia studied 5.053% had pathological lesions, of which 3.368% of ovaries and 2.105% that of uterus.

Pathological conditions observed during the course of study were; Ovarian hypoplasia (0.316%); cystic ovarian degeneration (0.947%); cystic corpus luteum (0.421%); Chronic oophoritis (0.211%); Multifollicular atresia (0.105%); par ovarian cyst (1.368%); bursitis (0.842%); Salpingitis (0.105%); Macerated foetus (1.684%); Endometritis (0.211%); Cystic glandular hyperplasia (0.105%) and cyst in the endometrium with subepithelial haemorrhage (0.105%).

## 21 STUDIES ON ANOESTRUM IN CROSS-BRED CATTLE

Pillai, G. P. V.

*Thesis (M. V. Sc.) 1980.*

The object of the study was to assess the incidence of anoestrus among cross-bred cattle of Kerala and to find out the possible aetiological factors so as to evolve suitable therapeutic measures for the same. For this 184 cross-bred cows and 76 cross-bred heifers above 18 months of age maintained in the livestock farms attached to the Kerala Agricultural University and 401 cross-bred cows and heifers presented for treatment at various infertility camps in the state were utilised. The incidence of anoestrus was assessed from the breeding history and detailed gynaecological examinations. The nutritional status of the animal was determined by haematological examinations. The anoestrus animals showing nutritional deficiency were treated with 'Fertimin' brand of mineral mixture and those showing normal nutritional status were treated with 'Fertivet'.

Among the Farm animals, 28.3% of cows and 28.4% of heifers were in apparent anoestrus though true anoestrus was

observed only in 17.4% of cows and 22.4% of heifers. The other cases of apparent anoestrus were due to silent oestrus (3 to 15%), cystic ovaries (0.5 to 1.3%) and hypoplasia of ovaries (1.3%). Among the animals brought at various infertility camps true anoestrus was observed only in 28.2% cases, though 49.9% were reported to be anoestrus. The other cases were early pregnancy (2.7%), Cycling (7.7%), Cystic ovaries (0.2%), underdeveloped genitalia (9%), ovarian hypoplasia (0.2%) and in heat (1.7%).

Wide Calcium: Phosphorus ratio (2.69 and 2.46) and abnormal copper level (88.32 g/dl and 91.07g/dl) were detected in 46.6% of cows and 54.64% of heifers respectively.

'Fertivet' was capable of inducing ovulatory oestrus in 100% of cows and 89.47% of heifers in true anoestrus with a conception rate of 66.6% and 42.11% respectively. Treatment with 'fertimin' could induce ovulatory oestrus in 91.67% of cows and 78.26% of heifers within a mean period of 38.8 and 27.77 days respectively. The conception rate in cows and heifers treated with 'fertimin' was 50% and 43.48% respectively.

## 22 REPRODUCTIVE PERFORMANCE OF CROSS-BRED HEIFERS

Rajendraprasad, P. B.

*Thesis (M. V. Sc.)*, 1981.

The object of the study was to investigate the reproductive performance of crossbred heifers including the pattern of oestrus cycle. The lowest birth weight was observed in 62.5% Jersey crosses and highest in 50% Holstein crosses. Attainment of puberty was earliest in 62.5% Jersey crosses while this was latest in 50% Brown Swiss crosses. Minimum weight at puberty and weight at conception were noticed in 62.5% in Jersey crosses, whereas corresponding values were maximum in 50% Holstein crosses. Age at conception was lowest in 62.5% Jersey crosses and highest in 50% Brown Swiss. Number of inseminations per conception was highest in 62.5% Jersey crosses and 1 lowest in 75% Brown Swiss crosses. Birth weight had significant positive correlation with weight

at puberty and weight at conception in 50% Jersey crosses whereas in 62.5%, birth weight was significantly correlated only to weight at conception. Mean length of oestrous cycle was found to be 19.54 days in cross-breds studied with significant difference in length of oestrous cycle in different genetic groups. Mean duration of oestrus in cross-breds studied was found to be 16.97 hours with pronounced heat symptoms. Ovulation occurred between 8 and 20 hours after the end of oestrus in majority of cases. Incidence of anovulatory heat was highest in Brown Swiss crosses while that of metestrous breeding was highest in Holstein crosses.

### 23 UTERO-TUBAL INSUFFLATION TECHNIQUE FOR DIAGNOSIS OF TUBAL IMPATENCY IN COWS

Athman, K. V.

*Thesis (M.V.Sc.) 1981*

The objective of the study was to design an apparatus for utero-tubal insufflation test and to standardise its use in both excised genitalia and in live animals for the diagnosis and treatment of tubal impatency. Perfect obturation of cervix was obtained using a stainless steel catheter with 22 FR. Incidence of unilateral and bilateral impatency in excised genitalia were 8.70% and 19.25% respectively, while that of infertile animals were 2.70% and 13.62% respectively. The mean pressure at which air escaped from both the tubes in excised genitalia was 128.12 mm Hg. in cows and 148.93 mm. Hg. in heifers. In experimental animals the corresponding pressure in cows and heifers were 116.38 mm. Hg and 127.50 mm. Hg. respectively. The pressure range for producing "blown up" condition of the uterus in excised genitalia of cows and heifers were 100-280mm. Hg and 100-260 mm. Hg. respectively, while that of experimental animals were 120-220 mm Hg and 195-200 mm Hg respectively. Since the safety margin was estimated to be 60.00mm. Hg. in experimental cows, the test is considered to be safe diagnostic test for tubal impatency. Utero-tubal insufflation test could also be exploited for treatment of temporary tubal blockage Since 69.56% of cows with bilateral patency of salpinx on testing conceived after insemination.

## 24 OBSERVATIONS ON PARTURITION IN CROSS-BRED COWS

Jose, V. M.

*Thesis (M.V.Sc.), 1981*

The aim of the investigation was to study the gestation period and the process of parturition in cross-bred cattle. The gestation length of Jersey & Sindhi, Jersey & Local and Brown Swiss & Local was  $275.3 \pm 2.8$ ,  $279.3 \pm 2.5$  and  $280.5 \pm 2.6$  days respectively. The breed of the dam, sex of the calf and birth weight of the calf had no significant influence on the gestation length. In all the animals observed, the foetuses were in anterior presentation with dorso-sacral position. There were progressive increase in vulval and udder enlargement, presence of colostrum, relaxation of sacrosciatic ligaments and dilatation of cervix as parturitions were imminent. A significant drop in body temperature was noticed one day prior to parturition. The total duration of parturition was  $34.68 \pm 68.75$ ,  $668.2 \pm 97.17$  and  $912.5 \pm 182.68$  minutes respectively for Jersey & Sindhi, Jersey & Local and Brown Swiss & Local cows, the differences being statistically significant. Diurnal variation of calving was noticed with 60.53 percent during day time and 39.47% during night time. The total number of cotyledons and large sized cotyledons were significantly higher in gravid horn than in non-gravid horn. The weight of foetal fluids was found to range from 5.6 to 22.4 kg. with a mean of  $15.214 \pm 2.25$  kg.

## 25 POST PARTUM REPRODUCTIVE PERFORMANCES OF CROSS-BRED COWS

Bhaskaran, K. V.

*Thesis (M.V.Sc.), 1981.*

The object of the investigation was to study the various aspects of the postpartum reproductive performances of crossbred cows and to assess the reproductive efficiency by breeding cows before and after 60 days post partum.

Fifty two freshly calved and randomly selected crossbred cows were studied for genital involution, cyclic ovarian activity and post partum oestrus. These animals were grouped into normal and abnormal calvers and data recorded and analysed.



Twenty four crossbred cows selected at random were weighed at fortnightly intervals commencing from the day of calving till 90 days post-partum to study the pattern of gain or loss in weight and its influence on the post-partum heat and conception. To study the effect of early breeding on the future reproductive efficiency, 38 crossbred cows in oestrus were grouped into three. Insemination in group-I was done between 30 and 45 days, group-II between 46 and 60 days and group-III after 60 days post-partum respectively. Data collected were subjected to statistical analysis and fertility assessed.

Abnormal calving significantly delayed the uterine involution, cessation of uterine lochia, involution of vulva regression of pregnancy corpus luteum and onset of first observed oestrus. The rate of uterine and vulval involution was significantly higher in primipara than pluripara. In contrast, primiparous cows took a significantly longer interval for the onset of first observed heat. Animals which gained body weight after calving exhibited early oestrus and better fertility. Breeding of cows between 30 and 60 days post-partum yielded high fertility without adversely affecting milk yield thus reducing the service period and calving interval.

## 26 OBSERVATIONS ON GESTATION AND PARTURITION IN GOAT *CAPRA HIRCUS*

Kuriakose, K. K

*Thesis (M. V. Sc.), 1981*

A systematic study involving the use of 85 does comprising Malabari, Alpine & Malabari and Saanen & Malabari, crosses were carried out in order to ascertain the gestation length, process of parturition and placental details. Also breeding particulars were studied from the registers available.

The average gestation length of different genetic groups of goats was found to be  $143.66 \pm 0.53$  days. Genetic groups, parity, sex and number of the kids and season had no influence on the period of gestation. The frequency of occurrence of single, twin and multiple births was found to be 50.74%, 40.05% and 4.19% respectively.

The signs of approaching/parturition such as tumefaction of the vulva, udder engagement and relaxation of pelvic ligaments were only moderate in the beginning but intense nearing parturition. Colostrum was present in all animals two days prior to parturition. In all the does visible flow of cervical mucus was evident 24 hours before parturition. The genetic group was not found to affect duration of parturition. Total duration of parturition was  $360.91 \pm 30.85$ ,  $358.20 \pm 16.67$  and  $395.42 \pm 40.09$  minutes in single births and  $359.12 \pm 26.15$ ,  $357.20 \pm 32.23$  and  $368.73 \pm 24.03$  minutes in multiple births in Malabari, Alpine & Malabari and Saanen & Malabari goats respectively. The weight of kid was positively correlated to the weight of placenta, total number of cotyledons and to the number of large and medium sized cotyledons and it was negatively correlated with number of small sized cotyledons. Number of cotyledons in gravid horn was significantly higher than in non-gravid horn. Weight of the placenta as well as total number of cotyledons was found to be more in multiple pregnancy than in single pregnancy.

## 27 INFLUENCE OF DEXTROSE ON FERTILITY OF REPEAT BREEDING COWS

Naveen, P. K.

*Thesis (M. V. Sc.) 1983*

The object of the study was to assess the efficiency of intrauterine administration of dextrose after insemination in improving the breeding efficiency of repeaters. Post-insemination intra-uterine administration of 50 ml of 15% dextrose to 147 repeat breeders resulted in conception rate of 47.62% as against 15.38% in 13 controls, the difference being significant.

The data on the treatment and control animals were grouped on basis of blood glucose level, parity, age, post-partum interval in months, number of previous unsuccessful inseminations and type of semen used for insemination. Significant statistical association between conception rate and blood glucose level was observed. The blood glucose level of normal cows ( $59.79 \pm 1.63$  mg/100 ml) which settled to one or two inseminations was significantly higher than that of repeaters

( $53.02 \pm 0.69$  mg/ml). The conception rate was more in cows than in heifers through the blood glucose level did not show significant variations between the groups. A positive correlation was observed between parity and fertility and between age and fertility. Blood glucose level did not show significant variation between age groups. Highest fertility rate was obtained in animals inseminated with frozen semen and lowest in those animals inseminated with CME semen. Administration of a combination of dextrose and antibiotics after insemination was found to increase the conception rate in repeaters which failed to conceive to post insemination dextrose therapy.

## 28 PROSTAGLANDIN ADMINISTRATION IN IMPROVING THE BREEDING EFFICIENCY OF SUBOESTROUS COWS Nair, R. R.

*Thesis (M. V. Sc.) 1983*

The object of the study was to find the incidence of postpartum suboestrus in crossbred cattle and to evaluate the efficiency of PGF<sub>2</sub> alpha (Estrumate) in the treatment of suboestrus animals.

For this, the cross-bred cows belonging to University Livestock Farm, Mannuthy reported to be anoestrus even after 45 days postpartum were subjected to detailed clinico-gynaecological examination and those having palpable corpus luteum were considered as suboestrus. Out of these, 54 cows having active corpus luteum of 7-14 days of age were given 500 microgram of Estrumate and the result of treatment was assessed.

The incidence of post-partum anoestrus was 45.68%. After the administration of the drug 98.15% cows exhibited oestrus at an average interval of  $53.2075 \pm 1.038$  hours. The percentage of treated animals which conceive at first insemination was 43.4. Conception rate in the induced heat was significantly influenced by the intensity of heat. The number of inseminations required per conception did not vary significantly from the rest of the herd. The service period of treated animals was significantly shorter ( $92.4583 \pm 3.5394$ ) than that of the herd ( $135.11 \pm 6.9742$ ) days.

## 29 EFFECT OF DIFFERENT DIETARY LEVELS ON THE POST-PARTUM REPRODUCTIVE PERFORMANCE OF REPRODUCTIVE COWS

Alexander, M. I.

*Thesis (M. V. Sc.) 1983*

The object of the study was to assess the influence of higher dietary levels on the postpartum reproductive performance of cross-bred cows. Thirty crossbred cows weighed at 270th day of gestation and on the day of calving were randomly allotted to control, treatments I and II. The control received ration based in Sen and Ray standard whereas, treatment I and II received 115 and 130% of control ration. The weight of cows were recorded at 15 days interval from calving to oestrus. Serum inorganic phosphorus, protein, glucose and haemoglobin percentage of 5 cows from each group was estimated.

A decline in the body weight was observed in the first fortnight in all the three groups while this trend continued upto 30 days in control as against the increase from 15th day in treatment group.

The post partum oestrous interval of control, treatment II were  $62.1 \pm 4.63$ ,  $56.60 \pm 5.53$  and  $53.22 \pm 3.75$  days respectively and these values did not vary significantly. Post-partum oestrous interval of treatment I & II was significantly less than that of the herd.

Serum inorganic phosphorus was significantly higher on the day of oestrus in control and treatment II. There was significant difference in serum protein values between groups at certain time intervals. Serum protein values were higher on the day of oestrus in all the groups while blood glucose and haemoglobin were significantly higher on the day of oestrus in treatment I. Results indicated that Sen and Ray ration is adequate to meet the requirement for both production and reproduction of cross-bred cows.

### 30 THERAPY FOR ANOESTRUM IN CROSS-BRED CATTLE

Kurian, M. O.

*Thesis (M.V.Sc.) 1983*

The object of the study was to assess the efficiency of Clomiphene citrate' (Fertivet FVT-300) and oestrogen and progesterone ('Secrodyl') in the treatment of 'true anoestrus' in crossbred cows and heifers. The incidence of anoestrus among crossbred cows and heifers are also assessed. The materials for the investigation involved 575 cows and 446 cross-bred heifers belonging to University Livestock Farm and animals brought for examination in infertility camps. Though the reported cases of anoestrus was 31.3% and 36.99% among cows and heifers respectively, a detailed gynaeco-clinical examination revealed a lesser incidence of 9.74% and 13.68% of true anoestrus among cows and heifers. The animals were allotted randomly into two groups keeping control animals for each group. One tablet of 'Fertivet FVT-300' for five consecutive days were given intramuscularly for five consecutive days. Animals were watched for heat and confirmed by rectal examination. Pregnancy diagnosis was done 45 to 60 days, after insemination and reinseminations were done wherever necessary.

'Fertivet' was capable of inducing ovulatory oestrus in 68.42% of cows and 63.64% of heifer hsin true anoestrus with a conception rate of 42.11% and 33.30% respectively. Treatment with 'secrodyl' could induce ovulatory oestrus in 50% of cows and 50% of the heifers with a conception rate of 15% and 14.28% respectively. The results of treatment with 'fertivet' and 'secrodyl' in true anoestrus group were significantly different from the control group. However, 'Fertivet' was found to be more effective in treatment of true anoestrus than 'secrodyl'.

### 31 PRELIMINARY TRIALS ON PRESERVATION OF BUCK SEMEN IN GLYCEROL CONTAINING DILUENTS

Sarmah, A. K.

*Thesis (M. V. Sc.) 1983*

A systematic study was made on normal characteristics and preservation of 240 ejaculates of Malabari and Alpine &

Malabari buck semen in chilled and frozen conditions. A positive correlation between reaction time and mass activity was observed. Semen volume was higher in crossbred bucks ( $0.72 \pm 0.015$  ml.) than in indigenous breed ( $0.55 \pm 0.017$  ml.) Colour of semen varied from milky yellow to creamy white. Mass activity varied significantly between bucks, between breeds a significant difference in motility was noticed. A significant positive correlation of initial motility with live sperm percentage was observed. Between bucks a significant difference in sperm concentration could be seen.

Effect of room temperature and refrigeration temperature, glycerolisation of Tris and reconstituted skim milk diluents having varying percent levels of glycerol on preservability of buck spermatozoa were studied. Refrigeration temperature glycerolisation was found to be significantly superior to room temperature glycerolisation in preserving motility percentage in both Tris and skim milk diluents.

However, total abnormality percentages at room temperature glycerolisation was significantly higher than at refrigeration temperature glycerolisation. The level of abnormality increased with the level of glycerol in both diluents. The present study revealed an increase in acrosomal defects with the advancement of storage period. The occurrence of acrosomal defects was significantly higher in room temperature glycerolisation.

The average post thawing motility in Tris and skim milk diluent was 44.44 and 31.06 per cent respectively. Tris diluent was found to be significantly superior to skim milk diluent for freezing buck spermatozoa.

## 32 EFFECT OF FREQUENCY OF EJACULATION ON SEMEN CHARACTERISTICS AND LIBIDO IN CROSS-BRED BUCKS

Metilda Joseph

*Thesis (M. V. Sc.) 1983*

The objective of the study was to find out the optimum number of collections per day which can be taken from adult

cross-bred bucks without adversely affecting their libido and semen quality. For 3 months, ejaculation frequencies at the rate of once, (Gr. I), twice (Gr. II) and thrice (Gr. III) daily for a continuous period was performed.

Ejaculation frequencies influenced colour, density, mass activity, concentration and Methylene Blue Reduction Test (MBRT). However volume, pH, percentage of dead sperms, abnormal sperms and sperm viability were unaffected. Frequency of ejaculation did not affect the libido of bucks. A positive correlation between sperm viability at 46.5°C for 30 min. and preservation at 6 to 8°C for 96 hours was observed. In Group-II significant difference between ejaculates was seen in density, mass activity, pH, concentration and MBRT. However, in group III all seminal attributes except percentage of dead sperms showed significant difference between ejaculates.

Upon increasing the frequency of collection from once to twice or thrice daily a significant drop in spermatozoan concentration was observed. But it could be established that there is no deterioration of semen quality with increasing collection frequency. Increasing the frequency of collection from one to two times daily has definite advantage as it yields more spermatozoa for artificial insemination.

### 33 EFFICACY OF INTRAUTERINE ADMINISTRATION OF GENTAMYCIN IN THE TREATMENT OF CLINICAL ENDOMETRITIS IN CROSS BRED CATTLE

Varadarajan, M.

*Thesis (M.V.Sc.) 1985*

The objective of the study was to assess the efficacy of intrauterine infusion of Gentamycin, either alone or in combination with stilbestrol in the treatment of clinical endometritis. Isolation of sensitive organisms and sensitivity test were also carried out on a limited number of cases.

One hundred and seventy cross-bred cows and heifers with clinical endometritis were randomly allotted into two groups Group I animals were given 250 mg of Gentamycin

intrauterine and group II were treated with a combination of gentamycin and 10 mg stilbestrol. Those animals which were completely free of infection were inseminated in the next heat and rest were given a second infusion of above drugs. Conception rate was worked out both on actual pregnancy verification and 90 days non return rate.

The percentage of clinical recovery with single infusion in Group I and II were found to be 96.51 and 94.03 respectively. The number of intrauterine infusion was not found to influence the conception rate and recovery period. The overall conception rate and number of inseminations per conception in group-I were 72.58% and 1.91 respectively, while the corresponding values for group-II animals were 63.63% and 2.39. The parity of the animals did not affect the effectiveness of the treatment. It was found that addition of stilbestrol in the Gentamycin infusion did not have any added beneficial effect. The bacterial isolates were *Haemophilus* (8%), *Staphylococcus* (20%), *Bacillus* (4%), *Pasteurella* (8%), *Actinobacillus* (4%), *Necromonas* (12%), *Lactobacillus* (4%) and *streptobacillus* (4%). Sensitivity study has proved that most of the isolates were sensitive to Gentamycin and hence it is considered to be the effective antibiotic for treating uterine infection.

#### 34 CHANGES IN SPERM MORPHOLOGY OF CROSSBRED BUCKS DURING PRESERVATION

Durah, P. K.

*Thesis (M. V. Sc.), 1985*

The object of the study was to assess the semen characteristics of cross-bred bulls and to investigate on the morphological changes during preservation in egg yolk citrate, Tris and skim milk diluents upto 72 hours.

For this 72 ejaculates from five crossbred bulls were subjected to routine evaluation and smears were stained with Giemsa stain and examined for various types of sperm abnormalities and sperm head biometry. Semen samples were diluted at the rate of 1:20 in E.Y.C. Tris and skim milk diluent



and stored at 5°C and the motility, sperm abnormality and sperm head biometry were observed at 0, 24, 48 and 72 hours.

The average concentration and livability of sperm was  $1.59 \pm 0.025$  million per cm. and  $83.45 \pm 0.522\%$  respectively. The overall average initial motility was  $83.00 \pm 1.00$  percent before dilution. After 72 hours of storage there was no significant difference in sperm motility between diluents, but significant variation was noticed between the bulls. Sperm abnormalities except simple bent tail did not show any significant difference between diluents. Among the sperm abnormalities, detached acrosome and simple bent and coiled tail increased significantly with the advancement of storage period. The average length and breadth of the sperm head was found to be 9.51 and  $4.72 \mu$  which showed a significant variation between bulls. Neither the diluent nor the storage period was found to influence the sperm biometry. Thus all the three diluents were found to be equally good for preservation of bull semen upto 72 hours at 5°C.

## Summary of Dissertation work done in the Department of Animal Reproduction

### 1 AN INQUIRY INTO THE COCONUT WATER AS A CONSTITUENT OF SEMEN DILUENT

Ayer, A. V.

*Dissertation* (1966)

The object of the study was to find out the keeping quality of bull semen in coconut water yolk-citrate diluent. For this a comparative study of the motility and viability of the sperms on storage upto 72 hours suspended in yolk citrate and coconut water citrate diluent was undertaken. Statistical analysis revealed that the addition of coconut water in yolk-citrate is of definite advantage in increasing keeping quality of semen.

## 2 CERVICAL MUCUS TEST AS AN AID IN EARLY DIAGNOSIS OF PREGNANCY IN CATTLE

Sethumadhavan, A.

*Dissertation* (1966)

Cervical mucus collected from 150 cows and 12 abattoir specimens were treated with distilled water and 10% sodium hydroxide to study the accuracy of the tests in detecting early pregnancy. The results of the cervical mucus test were 100% accurate in non-pregnant cows and 91.5% in pregnant cows.

## 3 INVOLUTION OF UTERUS IN SINDHI COWS

Francis, E. C.

*Dissertation* (1968)

The process of involution of uterus in 30 Sindhi cows was studied. The time taken for complete involution of uterus varied from 32 to 44 days with an average of  $36.27 \pm 0.69$  days, the rate being faster upto 13th day post-partum, Involution of vulva took an average period of  $31.60 \pm 0.73$  days. Post partum complications were found to delay the involution process. A positive correlation was observed between the onset of post-partum heat and involution time.

## 4 A COMPARATIVE STUDY OF THE SEMEN CHARACTERISTICS OF SAANEN BUCKS

Krishnan, N. P.

*Dissertation*, (1968)

The characteristics of semen samples obtained from Saanen and Malabari breeds of bucks stationed at Goat Farm attached to the Kerala Veterinary College and Research Institute were studied.

It was observed that there is no significant variation in the semen characteristics between these two breeds.

## 5 A STUDY ON PRESERVATION OF BUFFALO SEMEN

Chandrasahana, M.

*Dissertation* (1968)

The keeping quality of buffalo semen was investigated in different media viz EYC with diluents coconut water yolk citrate, coconut water yolk citrate with Vitamins and EYC. It was observed that coconut water yolk citrate with 3600 iu Vitamin A and 5 mgm of Vitamin C was superior to other two diluents. In order to superiority next best was coconut water

yolk citrate. EYC was found inferior for diluting buffalo semen. However, addition of Vitamin A and C in EYC improved the keeping quality of the buffalo semen.

6 A STUDY ON THE EFFICACY OF CME AS A SEMEN DILUENT AT ROOM TEMPERATURE

Pillai, G. G.

*Dissertation* (1969)

An investigation to study the suitability of coconut milk extender (CME) for preservation of bull and buffaloe semen at room temperature was carried out utilising 12 semen samples from bulls and 7 semen samples from buffaloes.

7 AN ENQUIRY INTO THE UTILITY OF HONEY AS A CONSTITUENT OF SEMEN DILUENT

Ramadas, K.

*Dissertation*, (1969)

The object of the study was to find the utility of commercially available honey as a constituent of diluent for bull and buffaloe semen. The diluent was a combination of 95 parts 5% honey solution and 5 parts 2% sodabcarb. To ninety-three parts of this solution 7% egg yolk was added and pH was adjusted to 7.2. Penicillin, streptomycin and sulphanilamide were used to prevent bacterial multiplication. Egg yolk citrate (EYC) and Sodabcarb Glucose (S. B. G. S.) diluent were used as control diluents for extending bull and buffaloe semen respectively. The initial motility and motility upto 72 hours or preservation were studied. Conception rates were assessed in cows and buffaloes using the extended semen.

Honey sodabcarb yolk diluent was significantly superior to both egg yolk diluent citrate and S. B. G. S., in maintaining keeping quality and preserving fertility rate of both bull and buffaloe semen.

8 A STUDY ON THE EFFICACY OF C. M. E. AS A DILUENT FOR THE PRESERVATION OF BUCK SEMEN AT ROOM TEMPERATURE

Pillai, B. V.

*Dissertation*, (1971)

The efficacy of C. M. E. in different dilution of 1:100, 1:150 and 1:200 for the preservation of buck semen at room temperature was studied.

It was found that C. M. E. can be successfully used for preservation of buck semen up to 24 hours of storage in all the three dilution rates while the livability of spermatozoa in 1:200 was superior to the other two.

#### 9 EFFECT OF 'FORTEGE' ON SEXUAL DESIRE AND QUALITY OF SEMEN OF BULLS

Pillai, K. V.

*Dissertation (1971)*

In order to study the effect of 'Fortege' on the sexual activity of breeding bulls, 15 tablets of 'Fortege' daily for the first seven days and 10 tablets for the next seven days were administered into two groups of bulls, one with normal sex vigour and another with poor libido. After the treatment bulls with low sex vigour evinced better sexual activity though disinclination towards service continued. The reaction time in normal bulls were found reduced significantly.

#### 10 A STUDY ON PRESERVATION OF BUCK SEMEN

John, K. J.

*Dissertation (1970)*

Comparative merit of diluents for preserving buck semen viz. (i) Egg yolk citrate (ii) Yolk citrate (iii) Whole cow milk and (iv) Whole goat milk was studied. The semen samples were diluted by split sample technique at the rate of 1:10 and the motility on storage at 5°C was studied every 24 hours of storage till 72 hours. It was observed that whole cow's milk was better than the other three diluents for maintaining motility and livability of buck semen.

Trials conducted on preservation of buck semen at room temperature with CME of different pH viz. 6.4, 6.7, 7.0 and 7.4 were not fruitful since the motility and livability of spermatozoa had reduced very much at 24 hours of storage.

#### 11 STUDIES ON INCIDENCE OF EARLY EMBRYONIC LOSS IN GOATS BASED ON ABATTOIR SPECIMENS

Achuthankutty, K.

*Dissertation (1971)*

In order to assess the embryonic mortality in goats and sheep gravid uteri were collected from the slaughter house over a period of 6 months. Embryonal loss was calculated by finding the difference between the number of corpora lutea

present in each ovary and number of fetuses in each horn. The functional status of ovaries, rate of twinning and multiple gestation and the incidence of transuterine migration were studied.

Early embryonic mortality in goat and sheep were found to be 41% and 2.1% respectively. In goat out of the total ovulation 44% was from left ovary and 56% from right ovary, the functional activity of ovaries was highly significant. In sheep also right ovary was found to be more active. The percentage of twin and triplet pregnancy was very high compared to sheep while in sheep single pregnancy was very high compared to goats. Out of 176 genitalia studied in goat 41.48% showed incidence of transuterine migration. The migration from left horn to right was found to be of high incidence. In case of multiple ovulation and also single ovulation transuterine migration occurred, the incidence was more in the former case. In sheep incidence of transuterine migration was about 13.54%. The fairly high percentage of transuterine migration in single ovulation questions the validity of the claim that transuterine migration is meant for spacing the developing ova in both horns more or less equally.

## 12 EFFECT OF ADMINISTRATION OF POTASSIUM IODIDE ON SEX DESIRE AND SEMEN CHARACTERISTICS OF BREEDING BULLS

Ibrahim, M. M.

*Dissertation (1972)*

To study the effect of administration of potassium iodide on the secretion time and semen characteristics of breeding bulls, 5 Jersey Sindhi bulls were fed with 50 mg of potassium iodide dissolved in water daily for a period of 30 days, after recording the reaction time and semen characteristics before the experiment.

It was found that administration of potassium iodide has beneficial effects in improving the sex libido, volume of semen, motility, concentration and resistance of spermatozoa. The beneficial effects, continued even after the administration of drug was discontinued.

