Table-1
Biometric parameters of control and high calorie diet fed adult female rats ($F_0$)

| Duration | Groups | Mean ± SE. | | | |
|---|---|---|---|---|---|
| | | Body Weight (gm) | Body Mass Index(BMI) ($gm/cm^2$) | Thoracic Circumference (cm) | Abdominal Circumference (cm) |
| Day zero | Control (ND) | 161.2 ±1.74 | 0.60 ±0.01 | 11.3 ± 0.1 | 13.08 ± 0.06 |
| | HCD | 161.6 ±1.24$^{(NS)}$ | 0.62±0.01 $^{(NS)}$ | 11.3±0.08 $^{(NS)}$ | 13.05±0.03 $^{(NS)}$ |
| 1st week | Control (ND) | 161.6± 2.22 | 0.60 ± 0.01 | 11.3 ± 0.09 | 13.09 ± 0.05 |
| | HCD | 170.4± 1.40***** | 0.68 ± 0.01***** | 11.55 ± 0.06 | 13.16 ± 0.03 |
| 2nd week | Control (ND) | 162.7 ± 2.27 | 0.61 ± 0.01 | 11.4 ± 0.09 | 13.16 ± 0.04 |
| | HCD | 176.6 ± 1.63***** | 0.72 ± 0.01***** | 11.8 ± 0.06***** | 13.4 ± 0.04***** |
| 3rd week | Control (ND) | 1625.2± 2.94 | 0.62 ± 0.01 | 11.5 ± 0.08 | 13.2 ± 0.05 |
| | HCD | 183.0 ± 1.03***** | 0.73 ± 0.01***** | 12.01± 0.06***** | 13.7 ± 0.06***** |
| 4th week | Control (ND) | 166.1± 2.57 | 0.62 ± 0.01 | 11.6 ± 0.08 | 13.3 ± 0.07 |
| | HCD | 188.1 ± 0.9***** | 0.75 ± 0.01***** | 12.2 ± 0.06***** | 13.8 ± 0.06***** |
| 5th week | Control (ND) | 168.0 ± 2.4 | 0.62 ± 0.01 | 11.7 ± 0.07 | 13.4 ± 0.07 |
| | HCD | 193.0 ± 1.08***** | 0.75 ± 0.00***** | 12.3 ± 0.07***** | 14.04 ± 0.07***** |
| 6th week | Control (ND) | 169.0 ± 2.58 | 0.62 ± 0.01 | 11.9 ± 0.09 | 13.48 ± 0.08 |
| | HCD | 197.0 ± 1.14***** | 0.77 ± 0.00***** | 12.5 ±0.07***** | 14.3 ± 0.07***** |
| 7th week | Control (ND) | 171.4 ± 2.67 | 0.63 ± 0.01 | 11.9 ±0.10 | 13.54 ± 0.08 |
| | HCD | 202.5 ± 1.38***** | 0.79 ± 0.00***** | 12.8 ± 0.05***** | 14.47± 0.07***** |
| 8th week | Control (ND) | 173.2± 3.02 | 0.63± 0.01 | 12.14±0.09 | 13.63 ± 0.08 |
| | HCD | 209.0± 1.62***** | 0.81 ± 0.00***** | 13.01 ± 0.06***** | 14.7 ± 0.08***** |

Note: All values are Mean ± SE. ND, normal diet; HCD, high calorie diet. Mean values of control and HCD groups were compared using student's t test and judged significant (*) if P< 0.05, NS, not significant.

Table-2

Concentrations of serum biochemical constituents in control and high calorie diet fed adult female rats ($F_0$)

| Duration | Groups | Mean Serum concentration (mg/100 ml) ± SE. | | |
|---|---|---|---|---|
| | | Fasting Glucose | Cholesterol | Triglyceride |
| 4 weeks | Controls (ND) | 66.08 ±1.89 | 64.13± 1.55 | 59.78 ± 1.60 |
| | HCD | 90.97 ±4.26***** | 79.8 ± 4.14***** | 80.83 ± 5.72***** |
| 8 weeks | Controls (ND) | 69.54 ± 1.75 | 67.6 ± 1.10 | 63.89 ± 1.94 |
| | HCD | 93.9 ± 5.58***** | 83.62 ±3.91***** | 92.16 ± 7.76***** |

Note: All values are Mean ± SE. ND, normal diet; HCD, high calorie diet. Mean values of control and HCD groups were compared using student's t test and judged significant (*) if $P< 0.05$

Table-3

Effects of high calorie diet on fertility indices of female ($F_0$) rats

| Fertility indices (Mean ±SE.) | Groups | |
|---|---|---|
| | Controls (ND) | HCD |
| Fertility index | 100 | 100 $^{NS}$ |
| Parturition index | 100 | 84.21 $^{NS}$ |
| Gestation Index | 100 | 93. ± 1.04 ***** |
| Litter Size | 8.88 ± 0.61 | 6.38 ± 0.78***** |
| Litter weight (gm) | 43.74 ± 2.74 | 35.79 ± 3.03***** |
| Body weight/pup (gm) | 5.0 ± 0.05 | 5.18 ± 0.07***** |
| Mortality of pups | 0 | 25 ± 6.7***** |

Note: All values are Mean ± SE. HCD, high calorie diet; ND, normal diet; NS, Not significant. Mean values of controls and HCD groups were compared using student's t test and judged significant (*) if P< 0.05, NS, not significant

Table-4
Biometric parameters of male offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Age in Post Natal Days ( PND) | Groups | Mean ± SE. | | | | |
|---|---|---|---|---|---|---|
| | | Body Weight(g) | Body Length(cm) | Body Mass Index(BMI) ($gm/cm^2$) | Thoracic Circumference (cm) | Abdominal Circumference (cm) |
| PND 7 | OCM | 8.98 ± 0.58 | 6.22 ± 0.11 | 0.22 ± 0.010 | 4.62 ± 0.15 | 4.78 ± 0.16 |
| | OHCDM | 11.82 ± 0.95* | 6.50 ± 0.20 NS | 0.27 ± 0.014* | 5.32 ±0 .14* | 5.50 ± 0.14* |
| PND 13 | OCM | 15.38 ± 0.58 | 7.46 ± 1.14 | 0.27 ± 0.004 | 5.24 ± 0.11 | 5.42 ± 0.16 |
| | OHCDM | 21.42 ± 1.17* | 8.16 ± 1.17* | 0.31 ± 0.011* | 5.90 ± 0.10* | 6.06 ± 0.14* |
| PND 17 | OCM | 21.2 ± 0.81 | 8.16 ± 0.22 | 0.31 ± 0.00 | 5.98 ± 0.25 | 6.04 ± 0.27 |
| | OHCDM | 30.18 ± 1.27* | 9.16 ± 0.22* | 0.35 ± 0.01* | 6.92 ± 0.28* | 7.18 ± 0.29* |
| PND 24 | OCM | 35.54 ± 2.45 | 10.41 ± 0.27 | 0.33 ± 0.00 | 6.83 ± 0.24 | 7.41 ± 0.24 |
| | OHCDM | 47.06 ± 4.44* | 11.25± 0.43 NS | 0.39 ± 0.02* | 7.82 ± 0.31* | 8.47 ± 0.3* |
| PND 36 | OCM | 47.6 ± 2.13 | 12.30 ± 0.30 | 0.35 ± 0.00 | 7.6 ± 0.29 | 8.30 ± 0.37 |
| | OHCDM | 78.2 ± 8.65* | 12.98 ± 0.32 NS | 0.45 ± 0.30* | 9.4 ± 0.50* | 10.22 ± 0.52* |
| Day of prepeutial separation | OCM | 136.0 ± 6.8 | 17.16± 0.18 | 0.40 ± 0.01 | 9.90 ± 0.10 | 11.0 ± 0.15 |
| | OHCDM | 153.8 ± 3.7* | 17.66 ± 0.10* | 0.48 ± 0.02* | 11.12 ± 0.09* | 12.18 ± 0.09* |
| PND 100 | OCM | 187.9 ± 2.30 | 19.6 ± 0.10 | 0.48 ± 0.00 | 11.46 ± 0.16 | 12.26 ± 0.19 |
| | OHCDM | 237.90±5.55* | 19.7 ± 0.37 NS | 0.61 ± 0.02* | 12.90 ±0.18* | 14.26 ± 0.22* |

Note: All values are Mean ± SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of control and OHCDM groups were compared using student's t test and judged significant (*) if $P < 0.05$, NS, not significant.

Table- 5
Serum biochemical profile of male offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Age in Post Natal Days (PND) | Groups | Mean Serum concentration (mg/ 100 ml) ± SE | | | | |
|---|---|---|---|---|---|---|
| | | Glucose | Cholesterol | Triglyceride | LDL | HDL |
| Day of preputial separation | OCM | 63.8 ± 1.52 | 46.20±1.82 | 59.0 ± 1.14 | 37.6 ±1.02 | 32.4 ± 0.87 |
| | OHCDM | 72.20 ±1.59***** | 56.8 ± 1.49***** | 67.6 ±1.32***** | 41.0 ±0.89***** | 29.3 ± 0.37***** |
| 100 | OCM | 70.10 ± 0.50 | 51.0 ± 3.56 | 64.0 ± 1.18 | 39.6 ±0.74 | 31.2 ± 0.58 |
| | OHCDM | 113.2 ±2.03***** | 86.8 ± 3.2***** | 110.4±2.80***** | 51.0 ±0.70***** | 26.6 ± 1.43***** |

Note: All values are Mean ± SE. OCM, offspring of control mothers; OHCDM , offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if $P< 0.05$.

Table- 6
Relative weight of the testes of male offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Groups | Age in post-natal days | | | | | | |
|---|---|---|---|---|---|---|---|
| | 7 | 13 | 17 | 24 | 36 | Day of preputial separation | 100 |
| OCM | 174.45± 11.14 | 220.0± 3.46 | 261.90± 15.04 | 577.80± 17.89 | 698.37± 10.44 | 907.36± 37.11 | 1066.46± 30.94 |
| OHCDM | 209.10 ± 6.4***** | 359.93 ± 10.56***** | 424.34 ± 27.57***** | 670.69 ± 11.23***** | 889.25 ± 42.08***** | 1036.28 ± 27.94***** | 1174.36± 25.86***** |

Note: All values are Mean ± S.E; OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if $P< 0.05$

Table-7

Relative weight of accessory organs of male offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Age in Post Natal Days (PND) | Groups | Mean Accessory organ weight (mg/100g body weight) ± SE | | |
|---|---|---|---|---|
| | | Epididymis | Vasdeferens | Seminal vessicle |
| PND of preputial separation | OCM | 142.7 ± 6.08 | 50.24 ± 2.09 | 199.32± 15.22 |
| | OHCDM | 167.95 ± 5.43* | 50.77 ± 2.27 NS | 203.81 ± 7.78 NS |
| PND 100 | OCM | 338.20 ± 9.09 | 57.95 ± 1.22 | 357.0 ± 23.95 |
| | OHCDM | 368.18 ± 9.27* | 64.80 ± 2.41* | 445.8± 21.34* |

Note: All values are Mean ± SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if P< 0.05, NS, not significant.

Table-8
Counts of germ cells in different stages of development in the testis of offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Age in Post Natal Days ( PND) | Groups | Mean number of germ cells/category/tubule cross section ± SE | | | | |
|---|---|---|---|---|---|---|
| | | Spermatogonia | Spermatocytes (leptotene & zygotene) | Pachytene Spermatocytes | Round Spermatids | Elongated Spermatids |
| PND 7 | OCM | 41.83 ± 2.98 | - | - | - | - |
| | OHCDM | 43.79± 0.84***** | - | - | - | - |
| PND 13 | OCM | 50.48 ± 2.27 | 1.90 ± 0.78[§] | - | - | - |
| | OHCDM | 55.24 ± 2.30[NS] | 6.68 ± 0.35 ***** | - | - | - |
| PND 17 | OCM | 45.56 ± 2.77 | 26.63 ± 1.00 | - | - | - |
| | OHCDM | 34.06± 1.55***** | 23.08± 0.68***** | - | - | - |
| PND 24 | OCM | 32.94 ± 1.89 | 40.19 ± 3.50 | 2.11 ± 0.52 | - | - |
| | OHCDM | 30.44 ± 0.98[NS] | 36.80 ± 2.56[NS] | 7.32 ± 1.13***** | - | - |
| PND 36 | OCM | 30.2 ± 0.70 | 36.57 ± 2.70 | 2.42 ± 0.47 | 2.08 ± 0.41 | - |
| | OHCDM | 22.93± 0.92***** | 45.81 ± 1.47***** | 2.16 ± 0.39[NS] | 10.80± 5.78[NS] | - |
| Day of preputial separation | OCM | 31.7 ± 0.52 | 20.39 ± 4.94 | 40.84 ± 1.37 | 77.44 ± 2.78 | 19.75 ± 1.02 |
| | HCDM | 14.84± 1.23***** | 44.69 ± 2.40 ***** | 47 .99 ± 4.03[NS] | 69.40 ± 1.40***** | 15.40 ± 1.06***** |
| PND 100 | OCM | 8.84 ± 0.45 | 38.97 ± 2.8 | 32.83 ± 4.24 | 49.68 ± 0.92 | 48.70 ± 0.85 |
| | HCDM | 6.92 ± 0.61***** | 42.34 ± 2.07[NS] | 40.52 ± 0.29***** | 44.44 ± 1.87***** | 44.61 ± 1.05***** |

Note**:** All values are Mean ± SE. [§]**,** only leptotene spermatocytes present; OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if P< 0.05, NS, not significant.

Table-9

Age (in days) at perpetual separation and sperm parameters on post-natal day 100 of offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Groups | Post-natal Day of Perpetual Separation | Total Sperm Count (millions/cauda epididymis) | Percentage of Abnormal Spermatozoa spermatozoa |
|---|---|---|---|
| OCM | 51.80 ± 1.15 | 23.5 ± 0.67 | 2.84 ± 0.24 |
| OHCDM | 46.2 ± 1.11***** | 19.0 ± 0.63***** | 9.90 ± 1.25***** |

Note: All values are Mean ± SE; OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of control (OCM) and obese group (OHCDM) were compared using student's t test and judged significant (*) if P< 0.05.

Table-10

Serum insulin, leptin and testosterone concentrations in male offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Hormones | Groups | Post Natal Days (PND) | | | | | |
|---|---|---|---|---|---|---|---|
| | | PND 13 | PND 17 | PND 24 | PND 36 | PND of prepeutial separation | PND 100 |
| Insulin (µIU/ml) | OCM | 4.50 ± 0.70 | 5.70 ± 0.20 | 5.92 ±0.34 | 5.55 ±0.12 | 14.90±1.67 | 19.4± 2.24 |
| | OHCDM | 6.98±0.70***** | 10.0 ±1.10***** | 7.62±0.36***** | 7.00±0.23***** | 28.39±5.8* | 43.57±3.49* |
| Leptin (ng/ml) | OCM | 1.42 ±0.01 | 1.57 ±0.02 | 1.76 ±0.04 | 2.06 ± .03 | 2.45 ± 0.03 | 3.18 ± 0.06 |
| | OHCDM | 1.60±0.05***** | 1.83 ±0.03***** | 1.97±0.00***** | 2.25±0.02***** | 2.61±0.05***** | 3.39 ±0.05***** |
| Testosterone (ng/ml) | OCM | 0.45 ± 0.02 | 0.60 ±0.05 | 1.73 ± 0.08 | 2.33 ± .14 | 3.17 ± 0.11 | 4.85 ±0.32 |
| | OHCDM | 0.20±0.05***** | 0.41 ± 0.04***** | 1.33 ±0.08***** | 1.90±0.05***** | 2.37 0.23***** | 3.67 ± 0.26***** |

Note: All values are Mean ± SE; OCM, offspring of control mothers; OHCDM , offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if P< 0.05.

Table-11

Biometric parameters of female offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Age in Post Natal Days ( PND) | Groups | Mean ± SE | | | |
|---|---|---|---|---|---|
| | | Body Weight(gm) | Body Mass Index(BMI) ($gm/cm^2$) | Thoracic Circumference (cm) | Abdominal Circumference (cm) |
| PND 1 | OCM | 5.06 ± 0.04 | 0.19 ± 0.0 | 3.38 ± 0.04 | 3.36 ± 0.05 |
| | OHCDM | 5.56 ± 0.13***** | 0.21 ± 0.0***** | 3.70 ± 0.12***** | 3.76 ± 0.11***** |
| PND 4 | OCM | 6.06 ± 0.22 | 0.21 ± 0.0 | 3.92 ± 0.08 | 3.98 ± 0.07 |
| | OHCDM | 8.02 ± 0.33***** | 0.23 ± 0.0***** | 4.36 ± 0.13***** | 4.5 ± 0.10***** |
| PND 7 | OCM | 7.54 ± 0.34 | 0.21 ± 0.0 | 4.18 ± 0.10 | 4.40 ± 0.08 |
| | OHCDM | 10.6 ± 0.89***** | 0.25 ± 0.01***** | 4.82 ± 0.21***** | 5.06 ± 0.12***** |
| PND 15 | OCM | 16.74 ± 1.86 | 0.28 ± 0.0 | 5.32 ± 0.14 | 5.44 ± 0.16 |
| | OHCDM | 21.5 ± 0.63***** | 0.30 ± 0.0***** | 6.14 ± 0.15***** | 6.26 ± 0.16***** |
| PND 21 | OCM | 26.26 ± 1.27 | 0.29 ± 0.0 | 6.24 ± 0.11 | 6.62 ± 0.12 |
| | OHCDM | 32.6 ± 1.86***** | 0.32 ± 0.0***** | 6.84 ± 0.21***** | 7.26 ± 0.25***** |
| PND 28 | OCM | 40.8 ± 2.85 | 0.33 ± 0.0 | 7.26 ± 0.16 | 7.64 ± 0.27 |
| | OHCDM | 51.7 ± 3.87***** | 0.38 ± 0.01***** | 8.06 ± 0.16***** | 8.98 ± 0.12***** |
| Vaginal opening | OCM | 76.22 ± 3.58 | 0.41 ± 0.02 | 8.46 ± 0.07 | 9.42 ± 0.17 |
| | OHCDM | 88.50± 1.51***** | 0.47 ± 0.0***** | 9.16 ± 0.18***** | 10.10 ± 0.18***** |

Note: All values are Mean $\pm$ SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers; Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if $P < 0.05$.

Table- 12

Concentrations of serum biochemical constituents on the day of vaginal opening in female offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Groups | Mean serum concentration (mg/ 100 ml) ± SE | | | | |
|---|---|---|---|---|---|
| | Glucose | Cholesterol | Triglyceride | LDL | HDL |
| OCM | 48.6 ± 0.50 | 39.4 ± 0.50 | 58.4 ± 0.92 | 32.8 ± 0.48 | 30.2 ± 0.37 |
| OHCDM | 56.76±1.41***** | 49.36± 0.49***** | 65.4 ±1.36***** | 40.6±0.67***** | 28.5 ±0.50 ***** |

Note: All values are Mean ± SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if P< 0.05.

Table-13

Age (in days) at vaginal opening of female offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Groups | Post-natal Day of Vaginal opening |
|---|---|
| OCM | 37.8 ± 0.66 |
| OHCDM | 35.2 ± 0.86***** |

Note: All values are Mean ± SE; OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of control (OCM) and obese group (OHCDM) were compared using student's t test and judged significant (*) if P< 0.05.

Table-14

Oocytes and healthy follicle counts in the ovary of female offspring ($F_1$) of normal (control) and high calorie diet fed mother rats ($F_0$)

| Age in post natal day (PND) | Groups | Mean number /stage /ovary ± SE | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oocytes | Primordial follicles | Primary follicles | Pre-antral follicle | Antral follicle | Pre-ovulatory | Corpora lutea |
| PND 1 | OCM | 17328 ± 993.9 | - | - | - | - | - | - |
| | OHCDM | 12461.3± 559.7* | - | - | - | - | - | - |
| PND 4 | OCM | 3977.3 ± 151.9 | 2189.6 ± 31.7 | - | - | - | - | - |
| | OHCDM | 4244 ± 185.6 NS | 2437 ± 60.9* | - | - | - | - | - |
| PND 7 | OCM | 576.6 ± 23.56 | 3296± 98.07 | 758 ± 51.67 | 39.6 ± 1.2 | - | - | - |
| | OHCDM | 657.3± 17.97* | 4333 ± 123.2* | 910 ± 32.30* | 48 ± 0.5* | - | - | - |
| PND 15 | OCM | | 380 ± 32.2 | 215 ± 19.33 | 177.0 ± 3.5 | 12.3 ± 1.2 | - | - |
| | OHCDM | | 548 ± 30.4* | 257.2 ± 21.12 | 191.2 ± 4.7* | 16.6 ± 0.88* | - | - |
| PND 21 | OCM | | 757.3 ± 54.05 | 422.3 ± 22.06 | 198.33 ± 11.05 | 19.66 ± 0.66 | - | - |
| | OHCDM | | 1074 ± 22.8* | 573.6 ± 37.61* | 242.66 ± 3.38* | 26.66 ± 1.20* | - | - |
| PND 28 | OCM | | 2033.6 ± 74.9 | 896.33± 21.05 | 167.0 ± 8.7 | 21.66 ± 2.33 | - | - |
| | OHCDM | | 2232 ± 123.2 NS | 953.0 ± 69.06 NS | 230.6 ± 14.51* | 31.0 ± 1.52* | - | - |
| Vaginal opening | OCM | | 1529 ± 105 | 372.0 ± 49.39 | 146.3 ± 1.85 | 11.66 ± 0.33 | 3.0± 0.57 | 5.0 ± 0.57 |
| | OHCDM | | 1555 ± 104.3 NS | 502.3 ± 41.28 NS | 184.66± 6.38* | 16.66 ± 0.66* | 5.6 ± 0.3* | 7.66 ± 0.33* |

Note: All values are Mean ± SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if $P < 0.05$, NS, not significant.

Table-15

Atretic follicle counts in the ovary of female offspring ($F_1$) of normal (control) and high calorie diet fed mother rats ($F_0$)

| Age in post natal days (PND) | Groups | Mean number of atretic follicles /stage/ovary ± SE | | | |
|---|---|---|---|---|---|
| | | Primary follicles | Pre-antral follicles | Antral follicles | Pre-ovulatory Follicels |
| PND 7 | OCM | 6.66±0.33 | 4.66±0.66 | | |
| | OHCDM | 12.3 ± 0.33* | 7.33 ± 0.33* | | |
| PND 15 | OCM | 16.0 ±0.57 | 22 ± 0.57 | 4.33 ± 0.88 | |
| | OHCDM | 33.33 ± 4.05* | 36 ± 2.08* | 9 ± 0.57* | |
| PND 21 | OCM | 22.0 ± 0.57 | 25 ± 3.05 | 9.0 ± 0.57 | |
| | OHCDM | 38 ± 4.35* | 61 ± 3.0* | 23.3 ± 2.8* | |
| PND 28 | OCM | 22.3 ± 0.88 | 25 ± 1.0 | 8 ± 1.0 | |
| | OHCDM | 34.33 ± 1.45* | 37 ± 2.6* | 17.6 ±0.88* | |
| Vaginal opening | OCM | 11.6 ± 2.60 | 16.6 ± 0.88 | 8.0 ± 0.57 | 1.6 ±0.33 |
| | OHCDM | 19 ± 1.0* | 28 ± 1.52* | 12.6 ± 1.20* | 3.0 ± 0.0* |

Note: All values are Mean $\pm$ SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if $P< 0.05$.

Table-16

Serum concentrations of insulin, leptin and estradiol in female offspring ($F_1$) of normal (control) and high calorie diet fed female rats ($F_0$)

| Hormones | Groups | Post Natal Days (PND) | | | |
|---|---|---|---|---|---|
| | | 15 | 21 | 28 | Vaginal opening |
| Insulin (µIU/ ml) | OCM | 3.75 ±0.14 | 4.97 ±0.25 | 6.10 ±0.27 | 6.32 ±0.06 |
| | OHCDM | 7.22 ±0.51***** | 7.62 ±0.36***** | 10.82 ±0.64***** | 11.74 ±0.70***** |
| Leptin (ng/ml) | OCM | 1.25 ±0.03 | 1.46 ±0.04 | 1.69 ±0.04 | 2.16 ±0.06 |
| | OHCDM | 1.5 ±0.01***** | 1.69 ±0.01***** | 1.90 ±0.01***** | 2.48 ±0.03***** |
| Estradiol (pg/ ml) | OCM | 22.3 ±0.68 | 30.5 ± 0.53 | 37.8 ± 0.19 | 44.47 ±0.48 |
| | OHCDM | 27.3 ± 0.45***** | 34.88 ±0.42***** | 41.33 ±0.57***** | 51.93 ±1.02***** |

Note: All values are Mean ± SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mothers. Mean values of control and OHCDM groups were compared using student's t test and judged significant (*) if $P < 0.05$.

Table-17

Effects of high calorie diet on estrous cyclicity of $F_1$ rats

| | Groups | |
|---|---|---|
| | OCM | OHCDM |
| Mean number of estrous cycles/ 2 months ± SE | 19.3 ± 1.05 | 22.3 ± 0.9* |
| Mean length of estrous cycle ± SE | 4.9 ± 0.14 | 4.4 ± 0.17* |

Note: All values are Mean ± SE. OCM, offspring of control mothers; OHCDM, offspring of high calorie diet fed mother; Mean values of OCM and OHCDM groups were compared using student's t test and judged significant (*) if $P < 0.05$

Table-18

Effect of high calorie diet on biometric parameters of $F_1$ generation pregnant female rats

| | | Groups | | | | |
|---|---|---|---|---|---|---|
| | | ND♂ x HCD♀ | ND ♂x HCD♀ | HCD♂x ND♀ | HCD♂x HCD♀ | ANOVA F value df (3,19) |
| Body weight | Day Zero | 164.6±1.96 [a] | 196.4 ± 2.94 [b] | 169.6 ±0.74 [a] | 202 ± 2.60 [b] | 70.99 (P<0.001) |
| | 1st week | 177 ± 2.86 [a] | 218.2 ±4.55 [b] | 185 ±1.92 [a] | 224.6 ±2.71 [b] | 56.15 (P<0.001) |
| | 2nd week | 194 ± 1.70 [a] | 252.4 ±2.73 [b] | 202 ±1.35 [a] | 249 ± 5.37 [b] | 92.09 (P<0.001) |
| | 3rd week | 215.8 ±3.16 [a] | 269.2 ±3.02 [b] | 217.7 ±2.4 [a] | 268.6 ±4.22 [b] | 84.72 (P<0.001) |
| Body mass index (BMI) | Day Zero | 0.63 ±0.02 [a] | 0.82 ± 0.0 [b] | 0.62 ±0.0 [a] | 0.82 ± 0.0 [b] | 147.3 (P<0.001) |
| | 1st week | 0.73 ± 0.01 [a] | 0.90 ± 0.0 [b] | 0.73 ± 0.0 [a] | 0.90± 0.0 [b] | 202.9 (P<0.001) |
| | 2nd week | 0.84 ± 0.1 [a] | 0.99 ±0.0 [b] | 0.85 ±0.0 [a] | 0.99±0.00 [b] | 104.04 (P<0.001) |
| | 3rd week | 0.91± 0.0 [a] | 1.106±0.0 [b] | 0.92±0.01 [a] | 1.108± 0.01 [b] | 133.9 (P<0.001) |
| Thoracic circumference (TC) | Day Zero | 13.26 ±0.07 [a] | 15.13±0.05 [b] | 13.2±0.14 [a] | 15.2±0.03 [b] | 152.5 (P<0.001) |
| | 1st week | 13.9 ±0.05 [a] | 15.2±0.07 [b] | 14.0±0.103 [a] | 15.3±0.06 [b] | 97.2 (P<0.001) |
| | 2nd week | 14.3 ± 0.16 [a] | 15.5± 0.1 [b] | 14.59± 0.14 [a] | 15.8±0.05 [b] | 31.59 (P<0.001) |
| | 3rd week | 14.98 ±0.05 [a] | 16.3±0.14 [b] | 15.01± 0.08 [a] | 16.2± 0.05 [b] | 59.69 (P<0.001) |
| Abdominal circumference (AC) | Day Zero | 14.25±0.02 [a] | 17.15 ± 0.04 [b] | 14.24 ±0.02 [a] | 17.2 ±0.04 [c] | 93.8 (P<0.001) |
| | 1st week | 14.77± 0.06 [a] | 17.60 ±0.06 [b] | 14.83 ±0.09 [a] | 17.4 ± 0.08 [b] | 414.5 (P<0.001) |
| | 2nd week | 15.2 ± 0.09 [a] | 18.03 ±0.02 [b] | 15.2 ±0.09 [a] | 17.93 ±0.09 [b] | 356.09 (P<0.001) |
| | 3rd week | 15.22± 0.09 [a] | 18.03 ±0.02 [b] | 15.34±0.09 [a] | 17.9± 0.09 [b] | 356.09 (P<0.001) |
| | 4th week | 15.9 ± 0.05 [a] | 18.38 ± 0.11 [b] | 16.04 ±0.04 [a] | 18.19±0.09 [b] | 264.53 (P<0.001) |

Note: All values are Mean ± SE. ND♂-normal diet male (controls), ND♀- normal diet female (controls), HCD♂-high calorie diet fed male, HCD♀- high calorie diet fed female. All values are mean ± SE Mean values in each row were compared by one way ANOVA followed by Duncan' s multiple range test. Values with same superscript letters are not significantly different, whereas those with different superscript letters are significantly (P<0.05) different. ND, normal diet ($F_1$) born to control ($F_0$) mothers. HCD, high calorie diet born to obese ($F_0$) mothers.

Table-19

Fertility indices of $F_1$ offspring born to control and obese ($F_0$) rats

| | ND♂ x ND♀ | ND ♂ x HCD ♀ | HCD♂ x ND ♀ | HCD♂ x HCD♀ | ANOVA F value df (3, 19) |
|---|---|---|---|---|---|
| Fertility index of male (in %) | 100 | 100 | 100 | 100 $^{NS}$ | - |
| Fertility index of female (in %) | 100 | 100 | 100 | 100 $^{NS}$ | - |
| Parturition index (in %) | 100 | 100 | 100 | 100 $^{NS}$ | - |
| Gestation index | 100 $^{a}$ | 81.0 ± 9.27 $^{a}$ | 91.0 ± 5.56 $^{a}$ | 80.32 ± 8.3 $^{a}$ | 1.859 (P<0.001) |
| Litter size/rat | 9.8± 0.66 $^{a}$ | 4.4 ±0.5 $^{b}$ | 4.6 ± 1.36 $^{b}$ | 4.2 ± 0.37 $^{b}$ | 10.840 (P<0.001) |
| Litter weight (gm)/rat | 46.3 ± 2.5 $^{a}$ | 20.5 ± 3.8 $^{b}$ | 21.8 ± 6.3 $^{b}$ | 24.04 ± 2.64 $^{b}$ | 8.637 (P<0.001) |
| Body weight / pup (gm) | 4.9 ± 0.18 $^{a}$ | 5.36 ± 0.15 $^{b}$ | 4.85 ± 0.08 $^{a}$ | 5.5 ± 0.08 $^{b}$ | 5.076 (P<0.001) |
| Mortality of pups (in %) | Nil $^{a}$ | 31.6 ± 9.27 $^{b}$ | 15.00 ± 7.63 $^{ab}$ | 32.76 ± 4.33 $^{b}$ | 5.913 (P<0.001) |

Note: ND ♂-normal diet male (controls), ND ♀-normal diet female (controls), HCD♂-high calorie diet fed male, HCD♀- high calorie diet fed female. All values are mean ± SE. Mean values in each column were compared by one way ANOVA followed by Duncan's multiple range test. Values with same superscript letters are not significantly different, whereas those with different superscript letters are significantly (P<0.05) different, NS, not significant. ND, normal diet ($F_1$) born to control ($F_0$) mothers. HCD, high calorie diet born to obese ($F_0$) mothers.