**Table 1(a) Multilevel models for protein content as dependent variable**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Parameter | Fixed Effects only model | Mother-infant pair id random intercepts only model |
| Fixed effects estimate g/dl (SE) x 103 | LSEm | -34.98(3.99)\*\*\* | -35.86 (4.01)\*\*\* |
|  | Bwt z score | -23.66(8.12)\*\* | -24.42(11.47)\* |
|  | Gestation (weeks) | -5.42(2.06)\*\* | -8.91  (2.72)\*\* |
|  | Male sex | 44.36(18.88)\*\* | - |
| Random Variance estimate g/dl (SE) x103 | Residual | 48.06(2.90)\*\*\* | 11.87  (1.08)\*\*\* |
|  | Intercept | - | 37.58 (3.82)\*\*\* |
| Goodness of fita | No of parameters | 6 | 6 |
|  | Raw Likelihood (-2LL) | -108.24 | -331.90 |
|  | X2change | 8.32\* | 231.98\*\*\* |
|  | dfchange | 3 | 3 |

a Models represent best fitting parsimonious models and change statistics are from a baseline fixed effects only model with LSEm as the only predictor variable (-2LL = -99.92; no. parameters = 3)

\*p<0.05 \*\*p<0.01 \*\*\*p<0.001

**Table 1(b). Multilevel models for fat g/dl as the dependent variable**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Parameter | Fixed Effects only model | Mother-infant pair id no random intercepts only model |
| Fixed effects estimate g/dl (SE) x103 | LSEm | -66.46(19.62)\*\* | -77.15(19.97)\*\*\* |
|  | Bwt z score | -143.30  (40.42)\*\*\* | -74.92(57.76) |
|  | Gestation (weeks) | -28.77(10.24)\*\* | -32.75(13.70)\* |
| Random Variance estimate g/dl (SE) x103 | Residual | 1181.38(71.50)\*\*\* | 287.18(26.50)\*\*\* |
|  | Intercept | - | 963.58(97.43)\*\*\* |
| Goodness of fita | No of parameters | 5 | 6 |
|  | Raw Likelihood (-2LL) | 1640.49 | 1425.46 |
|  | X2change | 206.21\*\*\* | 421.24\*\*\* |
|  | dfchange | 2 | 3 |

a Models represent best fitting parsimonious models and change statistics are from a baseline fixed effects only model with LSEm as the only predictor variable (-2LL = 1846.70; no. parameters = 3)

\*p < 0.05 \*\*p < 0.01 \*\*\*p < 0.001

**Table 1(c). Multilevel models with energy kcal/dl as the dependent variable**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Parameter | Fixed Effects only model | Mother-infant pair id no random intercepts only model |
| Fixed effects estimate g/dl (SE) | LSEm | -0.84(0.16)\*\*\* | -1.01(0.17)\*\*\* |
|  | Bwt z score | -0.99(0.33)\*\* | -0.45(0.47) |
|  | Gestation (weeks) | -0.25(0.08)\*\* | -0.28(0.11)\* |
| Random Variance estimate g/dl (SE) | Residual | 80.04(4.84)\*\*\* | 25.08(2.32)\*\*\* |
|  | Intercept | - | 60.50(6.67)\*\*\* |
| Goodness of fita | No of parameters | 5 | 6 |
|  | Raw Likelihood (-2LL) | 3956.79 | 3798.38 |
|  | X2change | 4951.55\*\*\* | 649.96\*\*\* |
|  | dfchange | 2 | 3 |

a Models represent best fitting parsimonious models and change statistics are from a baseline fixed effects only model with LSEm as the only predictor variable (-2LL = 4448.34; no. parameters = 3)

\*p<0.05 \*\*p<0.01 \*\*\*p<0.001

**Table 1(d). Multilevel models with carbohydrate g/dl as the dependent variable**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Parameter | Fixed Effects only model | Mother-infant pair id no random intercepts only model |
| Fixed effects estimate g/dl (SE) x103 | LSEm | -18.94(9.26)\* | -10.27(8.49) |
|  | Bwt z score | 47.25(16.60)\*\* | - |
|  | Gestation (weeks) | 8.45(4.23)\* | - |
|  | Vd (litres) | 283.25(104.28)\*\* | 245.31(93.74)\*\* |
| Random Variance estimate g/dl (SE) x103 | Residual | 126.99(9.48)\*\*\* | 42.76(4.97)\*\*\* |
|  | Intercept | - | 90.12(12.59)\*\*\* |
| Goodness of fita | No of parameters | 6 | 5 |
|  | Raw Likelihood (-2LL) | 277.96 | 183.65 |
|  | X2change | 362.73\*\*\* | 457.04\*\*\* |
|  | dfchange | 3 | 2 |

a Models represent best fitting parsimonious models and change statistics are from a baseline fixed effects only model with LSEm as the only predictor variable (-2LL = 640.69; no. parameters = 3)

\*p<0.05 \*\*p<0.01 \*\*\*p<0.001

**Table 2. Comparison of mean and standard deviation macronutrient value with previous HDM cohorts analysed using MIRIS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study** | **Macronutrient value mean (sd)** | | | |
|  | **Protein (g/dl)** | **Fat (g/dl)** | **Carbohydrate (g/dl)** | **Energy (kcal/dl)** |
| This Analysis  Q1-Q3 % difference  CV  N= 2966 | 0.89 (0.24)  32  0.27 | 2.99 (0.96)  46  0.32 | 7.09 (0.44)  9  0.06 | 60.37 (8.41)  18  0.14 |
| Michaelsson(36)\*  Q1-Q3 % difference  CV  N= 2553 | 0.90  27  - | 3.90  48  - | 7.19  5  - | 69.60  22  - |
| Wojick(37)  Q1-Q3 % difference  CV  N= 415 | 1.16 (0.25)  -  0.15 | 3.22 (1.00)  -  0.21 | \*\*7.80 (0.88)  -  0.11 | 65.00 (11.00)  -  0.12 |
| Cooper(38)  Q1-Q3 % difference  CV  N= 179 | 0.90 (0.40)  -  0.44 | 4.00 (1.40)  -  0.35 | \*\*6.60 (0.70)  -  0.11 | 66.00 (12.00)  -  0.18 |

Q1, Q3, Quartile 1, 3

\*No sd provided \*\*lactose

**Fig 1 Daily volume of milk expressed versus monthly lactation stage estimate**

