Effects of feeding treatment on growth rates, metabolic profiles, and age at puberty, and their relationships in dairy heifers. F. Abeni, F. Petrera, Y. Le Cozler, 2018, *animal* journal.

Figure S1: Changes in plasma BHBA (beta-hydroxybutyric acid) (a), total cholesterol (b), urea (c), creatinine (d) and ALP (alkaline phosphatase, e) in Holstein dairy heifers at 6, 9, 12 and 15 months of age, according to feeding treatment (67 heifers)

(c)

(d)

(e)

*1 SD, ID1, ID2: animals fed either on a standard (SD, n=27) or an increased-plane (ID1, n=27 & ID2, n=13) feeding rearing program*

*Significant differences: \*: P<0.05; \*\*: P <0.01; \*\*\*: P <0.001,* ^*: P<0.10.*

Figure S2: Changes in plasma glucose (a), non-esterified fatty acids (NEFA, c), urea (d), creatinine (d) and ALP (alkaline phosphatase, e) in Holstein dairy heifers at 6, 9, 12 and 15 months of age, according to class of age at puberty (56 heifers)

(a)

(b)

(c)

(d)

(e)

*1 Gr1, Gr2, Gr3 correspond to the three classes of age at puberty attainment before estrus synchronization: <9 mo of age (Gr1, n=18), 9 to 12 mo of age (Gr2, n=21), > 12 mo of age (Gr3, n=17)*

*Significant differences: \*: P<0.05; \*\*: P <0.01; \*\*\*: P <0.001,* ^*: P<0.10*

Table S1 Logistic regression parameters for body weight at birth and plasma variables at 6 mo of age to predict the ability to attain puberty before or after 12 mo (based on the 56 Holstein heifers presenting estrus cyclicity before hormonal synchronization)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item | Unit | Estimate | SE | Odd ratio | Lower CI | Higher CI | P value |
| Intercept |  | -39.3623 | 22.2244 | 8.04e-18 | 2.53e-44 | 3.88e-01 | 0.077t |
| Body weight at birth | kg | -0.1901 | 0.1201 | 8.27e-01 | 6.24e-01 | 1.03e+00 | 0.114 |
| Glucose | mmol/l | 1.1359 | 1.8748 | 3.12e+00 | 8.05e-02 | 1.68e+02 | 0.545 |
| NEFA | mmol/l | 14.8947 | 7.3113 | 2.94e+06 | 8.46e+00 | 8.05e+13 | 0.042\* |
| BHBA | mmol/l | 11.2527 | 5.7946 | 7.71e+04 | 8.60e+00 | 1.85e+11 | 0.052t |
| Total cholesterol | mmol/l | 4.5052 | 1.8451 | 9.05e+01 | 4.29e+00 | 1.11e+04 | 0.015\* |
| Triglycerides | mmol/l | -9.9666 | 10.7498 | 4.69e-05 | 1.86e-16 | 1.06e+04 | 0.354 |
| Urea | mmol/l | 1.4057 | 0.7760 | 4.08e+00 | 1.05e+00 | 2.94e+01 | 0.070t |
| Creatinine | µmol/l | -0.0888 | 0.0700 | 9.15e-01 | 7.78e-01 | 1.04e+00 | 0.204 |
| Total protein | g/l | -0.3002 | 0.2234 | 7.41e-01 | 4.27e-01 | 1.09e+00 | 0.179 |
| Albumin | g/l | 0.1629 | 0.4191 | 1.18e+00 | 5.09e-01 | 2.96e+00 | 0.698 |
| ALT | U/l | -0.4506 | 0.2670 | 6.37e-01 | 3.30e-01 | 9.98e-01 | 0.092t |
| AST | U/l | -0.0039 | 0.0347 | 9.96e-01 | 9.25e-01 | 1.07e+00 | 0.910 |
| GGT | U/l | -0.0584 | 0.1603 | 9.43e-01 | 6.80e-01 | 1.31e+00 | 0.716 |
| ALP | U/l | -0.0222 | 0.0141 | 9.78e-01 | 9.46e-01 | 1.00e+00 | 0.116 |
| TRAP | U/l | -0.1131 | 1.1716 | 8.93e-01 | 8.43e-02 | 1.02e+01 | 0.923 |
| Ca | mmol/l | 8.9422 | 5.2911 | 7.65e+03 | 9.98e-01 | 2.56e+09 | 0.091t |
| P | mmol/l | 2.7788 | 2.1769 | 1.61e+01 | 2.41e-01 | 2.09e+03 | 0.202 |
| Mg | mmol/l | -6.5338 | 7.6271 | 1.45e-03 | 4.78e-11 | 3.82e+03 | 0.392 |
| Na | mmol/l | 0.4837 | 0.3368 | 1.62e+00 | 8.55e-01 | 3.65e+00 | 0.151 |
| K | mmol/l | -0.2790 | 1.9236 | 7.57e-01 | 1.58e-02 | 4.50e+01 | 0.885 |
| Cl | mmol/l | -0.2720 | 0.3656 | 7.62e-01 | 3.52e-01 | 1.72e+00 | 0.457 |
| Fe | µmol/l | -0.2241 | 0.1076 | 7.99e-01 | 6.01e-01 | 9.51e-01 | 0.037\* |

*NEFA: non-esterified fatty acids; BHBA: beta-hydroxybutyric acid; ALT: alanine aminotransferase; AST: aspartate aminotransferase; GGT: (γ-glutamyltransferase; ALP: alkaline phosphatase; TRAP: tartrate-resistant acid phosphatase; Ca (Calcium), P (inorganic phosphorus), Mg (Magnesium), Na (Sodium), K (potassium), Cl (Chlorine), Fe (iron)*

*Significant effect at \*: P < 0.05; t: P<0.1.*