## Supplementary material

**Table S1.** Details of the experimental group, sex, maternal and paternal genetics and date of birth of each animal included in the study.

| Calf ID | Group | Sex | Genetics | Date of birth |
|---|---|---|---|---|
| 5523 | C-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 09/08/2018 |
| 5234 | C-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 16/08/2018 |
| 5276 | C-IVP | Female | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 01/09/2018 |
| 5860 | C-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 16/10/2018 |
| 2852 | C-IVP | Female | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 03/11/2018 |
| 8037 | C-IVP | Female | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 23/02/2019 |
| 8067 | C-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 07/03/2019 |
| 5861 | RF-IVP | Female | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 17/10/2018 |
| 6809 | RF-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 11/12/2018 |
| 6735 | RF-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 28/12/2018 |
| 8066 | RF-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 06/03/2019 |
| 0507 | RF-IVP | Male | Maternal: Charolais/Limousin<br>Paternal: Asturiana de los Valles | 19/03/2019 |
| 6758 | AI | Male | Maternal: Holstein<br>Paternal: Asturiana de los Valles | 11/01/2019 |
| 6759 | AI | Male | Maternal: Holstein<br>Paternal: Asturiana de los Valles | 11/01/2019 |
| 6762 | AI | Female | Maternal: Holstein<br>Paternal: Asturiana de los Valles | 11/01/2019 |
| 6760 | AI | Male | Maternal: Holstein<br>Paternal: Asturiana de los Valles | 11/01/2019 |
| 6761 | AI | Male | Maternal: Holstein<br>Paternal: Asturiana de los Valles | 11/01/2019 |
| 7918 | AI | Male | Maternal: Holstein<br>Paternal: Asturiana de los Valles | 29/04/2019 |
| 7925 | AI | Female | Maternal: Holstein<br>Paternal: Asturiana de los Valles | 05/05/2019 |

**Table S2.** Descriptive data (media, SEM, and maximum and minimum values) of each hormone analyzed per experimental group and age. Values without SEM correspond to single observations. For GH, the 13 values over the detection limit were excluded. These data establish baseline ranges in hormone concentrations in cattle up to 4 years of age, derived from assisted reproductive technologies. These data are foundational, as no comparable information is available for cattle of this age produced through assisted reproductive technologies.

| Group | Age (days) | AI | | C-IVP | | RF-IVP | |
|---|---|---|---|---|---|---|---|
| | | media ± SEM | max - min | media ± SEM | max - min | media ± SEM | max - min |
| **Cortisol (µg/dL)** | 75 | 0.6 ± 0.17 | 1.5 – 0.1 | 0.5 ± 0.17 | 1.3 – 0.1 | 0.7 ± 0.39 | 2.3 – 0.2 |
| **T4 (µg/dL)** | 75 | 4.5 ± 0.44 | 6.5 – 3.2 | 4.7 ± 0.34 | 5.6 – 3.4 | 4.9 ± 0.44 | 6.3 – 3.9 |
| **IGF-1 (ng/mL)** | 75 | 32.4 ± 4.69 | 48.3 – 15.0 | 28.4 ± 4.95 | 49.1 – 15.0 | 53.0 ± 7.30 | 76.9 – 34.3 |
| **GH (ng/mL)** | 75 | 3.0 ± 0.79 | 6.0 – 0.8 | 3.5 ± 1.84 | 14.3 – 0.9 | 6.1 ± 4.70 | 24.9 – 1.1 |
| **Cortisol (µg/dL)** | 150 | 0.5 ± 0.17 | 1.2 – 0.1 | 1.1 ± 0.36 | 3.0 – 0.2 | 0.9 ± 0.29 | 1.5 – 0.6 |
| **T4 (µg/dL)** | 150 | 5.5 ± 0.44 | 7.4 – 4.2 | 6.1 ± 0.36 | 7.4 – 4.5 | 5.7 ± 0.52 | 6.4 – 4.7 |
| **IGF-1 (ng/mL)** | 150 | 54.0 ± 11.20 | 97.1 – 15.0 | 28.5 ± 6.64 | 64.9 – 15.0 | 80.5 ± 25.38 | 128.0 – 41.3 |
| **GH (ng/mL)** | 150 | 2.4 ± 0.83 | 7.2 – 1.0 | 5.7 ± 2.90 | 22.2 – 1.3 | 6.0 ± 2.28 | 8.3 – 3.7 |
| **Cortisol (µg/dL)** | 360 | 0.2 ± 0.11 | 0.3 – 0.1 | 0.6 ± 0.32 | 1.0 – 0.3 | 0.5 ± 0.27 | 1.0 – 0.1 |
| **T4 (µg/dL)** | 360 | 4.6 ± 0.79 | 5.4 – 3.8 | 4.9 ± 0.43 | 5.3 – 4.5 | 5.8 ± 0.48 | 6.4 – 4.8 |
| **IGF-1 (ng/mL)** | 360 | 45.4 ± 30.40 | 75.8 – 15.0 | 120.9 ± 102.10 | 223.0 – 18.8 | 46.7 ± 11.93 | 67.8 – 26.5 |
| **GH (ng/mL)** | 360 | 3.9 | - | 7.6 | - | 7.5 ± 3.30 | 10.8 – 4.2 |
| **Cortisol (µg/dL)** | 550 | 0.4 ± 0.06 | 0.5 – 0.2 | 0.5 ± 0.19 | 0.9 – 0.3 | 0.1 | - |
| **T4 (µg/dL)** | 550 | 4.0 ± 0.38 | 5.3 – 3.2 | 4.0 ± 0.32 | 4.5 – 3.5 | 4.1 | - |
| **IGF-1 (ng/mL)** | 550 | 55.0 ± 12.09 | 95.0 – 31.6 | 55.9 ± 27.51 | 108.0 – 22.8 | 111.0 | - |
| **GH (ng/mL)** | 550 | 9.0 ± 2.31 | 13.5 – 2.6 | 5.1 ± 1.50 | 6.6 – 3.6 | 10.7 | - |
| **Cortisol (µg/dL)** | 900 | 0.9 ± 0.16 | 1.2 – 0.1 | 0.9 ± 0.54 | 3.6 – 0.1 | 0.9 ± 0.06 | 1.0 – 0.8 |
| **T4 (µg/dL)** | 900 | 4.4 ± 0.17 | 4.9 – 3.8 | 4.2 ± 0.41 | 6.1 – 3.3 | 4.6 ± 0.19 | 4.9 – 4.2 |
| **IGF-1 (ng/mL)** | 900 | 28.9 ± 5.18 | 41.4 – 15.0 | 19.3 ± 1.46 | 23.1 – 15.0 | 15.0 ± 10.23 | 45.7 – 15.0 |
| **GH (ng/mL)** | 900 | 6.0 ± 2.42 | 17.2 – 1.4 | 9.7 ± 5.06 | 24.6 – 2.5 | 3.4 | - |
| **Cortisol (µg/dL)** | 1100 | 1.1 ± 0.39 | 2.2 – 0.6 | 0.9 ± 0.21 | 1.5 – 0.4 | 1.6 ± 0.56 | 2.8 – 0.5 |
| **T4 (µg/dL)** | 1100 | 4.3 ± 0.10 | 4.5 – 4.2 | 4.6 ± 0.31 | 5.5 – 3.7 | 5.1 ± 0.48 | 6.1 – 4.0 |

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|---|---|---|---|---|---|---|---|
| **IGF-1 (ng/mL)** | 1100 | 38.8 ± 8.52 | 54.8 – 16.6 | 21.9 ± 3.85 | 31.4 – 15.0 | 41.1 ± 2.34 | 47.9 – 37.5 |
| **GH (ng/mL)** | 1100 | 3.9 ± 0.93 | 5.5 – 1.3 | 4.0 ± 1.84 | 7.7 – 2.2 | 12.2 ± 5.53 | 23.1 – 2.6 |
| **Cortisol (µg/dL)** | 1500 | 0.2 ± 0.15 | 0.4 – 0.1 | 0.6 ± 0.25 | 1.0 – 0.2 | 0.4 ± 0.03 | 0.4 – 0.4 |
| **T4 (µg/dL)** | 1500 | 4.0 ± 0.46 | 4.5 – 3.6 | 3.4 ± 0.68 | 4.3 – 2.0 | 4.4 ± 0.13 | 4.5 – 4.3 |
| **IGF-1 (ng/mL)** | 1500 | 70.0 ± 16.75 | 86.7 – 53.2 | 62.4 ± 1.96 | 65.7 – 58.9 | 134.9 ± 82.15 | 217.0 – 52.7 |
| **GH (ng/mL)** | 1500 | 3.4 ± 1.43 | 4.9 – 2.0 | 4.5 ± 2.64 | 9.8 – 1.3 | 7.3 ± 5.09 | 12.3 – 2.2 |

**Table S3.** Descriptive data (media and SEM) of each growth parameter measured per experimental group at representative ages. Values without SEM correspond to single observations. These data establish baseline ranges in growth parameters in cattle up to 4 years of age, derived from assisted reproductive technologies. These data are foundational, as no comparable information is available for cattle of this age produced through assisted reproductive technologies.

| Group | Age (days) | AI | C-IVP | RF-IVP |
|---|---|---|---|---|
| | | media ± SEM | media ± SEM | media ± SEM |
| **Weight (kg)** | 0 | 41.80 ± 2.3 | 41.33 ± 2.4 | 41.30 ± 3.7 |
| **Withers height (cm)** | 0 | 79.43 ± 0.9 | 74.80 ± 0.9 | 75.00 ± 0.6 |
| **Thorax circumference (cm)** | 0 | 84.29 ± 1.4 | 73.64 ± 7.5 | 84.40 ± 1.4 |
| **Body length (cm)** | 0 | 103.71 ± 2.9 | 105.17 ± 2.4 | 102.40 ± 2.9 |
| **Weight (kg)** | 75 | 82.79 ± 3.7 | 75.44 ± 5.6 | 76.76 ± 7.1 |
| **Withers height (cm)** | 75 | 88.57 ± 0.8 | 82.86 ± 1.7 | 82.40 ± 1.6 |
| **Thorax circumference (cm)** | 75 | 101.86 ± 1.2 | 97.00 ± 2.8 | 98.80 ± 4.2 |
| **Body length (cm)** | 75 | 118.43 ± 1.5 | 112.00 ± 2.0 | 114.40 ± 2.5 |
| **Weight (kg)** | 150 | 169.91 ± 5.6 | 140.60 ± 3.1 | 149.40 ± 9.0 |
| **Withers height (cm)** | 150 | 104.71 ± 1.4 | 94.71 ± 1.3 | 94.25 ± 1.7 |
| **Thorax circumference (cm)** | 150 | 128.00 ± 1.4 | 118.29 ± 0.9 | 121.50 ± 3.7 |
| **Body length (cm)** | 150 | 153.86 ± 2.7 | 141.29 ± 1.3 | 144.38 ± 3.9 |
| **Weight (kg)** | 360 | 410.00 ± 16.1 | 399.74 ± 19.8 | 391.80 ± 17.4 |
| **Withers height (cm)** | 360 | 140.43 ± 1.7 | 130.21 ± 1.9 | 129.80 ± 1.7 |
| **Thorax circumference (cm)** | 360 | 180.21 ± 2.6 | 172.57 ± 3.0 | 177.20 ± 2.4 |
| **Body length (cm)** | 360 | 196.00 ± 3.6 | 199.29 ± 3.1 | 188.80 ± 3.6 |
| **Weight (kg)** | 550 | - | 583.50 ± 21.3 | - |
| **Withers height (cm)** | 550 | 146.70 ± 2.0 | 144.33 ± 0.9 | 136.50 |
| **Thorax circumference (cm)** | 550 | 192.00 | 197.17 ± 4.4 | - |
| **Body length (cm)** | 550 | 220.00 ± 4.3 | 216.67 ± 7.5 | 210.00 |
| **Weight (kg)** | 750 | 613.29 ± 23.3 | 451.50 ± 12.5 | 540.00 ± 48.0 |
| **Withers height (cm)** | 750 | 148.43 ± 1.5 | 134.00 ± 1.0 | 135.67 ± 3.8 |
| **Thorax circumference (cm)** | 750 | 200.07 ± 2.7 | 179.00 ± 5.0 | 188.33 ± 7.0 |

| | | | | |
|---|---|---|---|---|
| **Body length (cm)** | 750 | 231.00 ± 6.0 | 218.50 ± 8.5 | 214.67 ± 11.5 |
| **Weight (kg)** | 900 | 686.00 ± 19.8 | 614.14 ± 28.1 | 598.50 ± 42.8 |
| **Withers height (cm)** | 900 | 151.33 ± 2.6 | 140.00 ± 2.8 | 138.25 ± 1.4 |
| **Thorax circumference (cm)** | 900 | 214.00 ± 2.3 | 202.00 ± 3.6 | 198.25 ± 5.3 |
| **Body length (cm)** | 900 | 233.50 ± 2.0 | 226.86 ± 5.5 | 222.25 ± 4.8 |
| **Weight (kg)** | 1100 | 769.40 ± 33.9 | 663.20 ± 29.0 | 650.25 ± 55.1 |
| **Withers height (cm)** | 1100 | 154.75 ± 2.8 | 148.60 ± 1.1 | 143.75 ± 3.9 |
| **Thorax circumference (cm)** | 1100 | 220.75 ± 1.7 | 210.20 ± 3.4 | 208.00 ± 6.5 |
| **Body length (cm)** | 1100 | 232.75 ± 4.1 | 228.00 ± 10.6 | 216.50 ± 5.5 |
| **Weight (kg)** | 1300 | 760.00 | 722.80 ± 41.9 | 662.33 ± 35.5 |
| **Withers height (cm)** | 1300 | 175.00 | 147.40 ± 2.6 | 152.00 ± 2.6 |
| **Thorax circumference (cm)** | 1300 | 232.00 | 215.40 ± 4.4 | 215.33 ± 4.6 |
| **Body length (cm)** | 1300 | 254.00 | 214.80 ± 18.1 | 230.33 ± 5.8 |
| **Weight (kg)** | 1500 | 769.50 ± 19.5 | 703.33 ± 24.7 | 705.50 ± 60.5 |
| **Withers height (cm)** | 1500 | 158.50 ± 0.5 | 151.00 ± 1.5 | 152.00 ± 3.0 |
| **Thorax circumference (cm)** | 1500 | 221.50 ± 1.5 | 214.67 ± 1.3 | 217.00 ± 1.0 |
| **Body length (cm)** | 1500 | 255.50 ± 2.5 | 209.00 ± 37.1 | 227.50 ± 5.5 |