**Supplementary Data**

Table S1. Group data on purebred dairy and dairy x beef steers in forage and pasture-based production systems, where spring-born cattle were kept on a moderately high indoor feed intensity and slaughtered at 21 months of age, while autumn-born cattle were kept on a low indoor feed intensity and slaughtered at 28 months of age. (IP = indoor period)

| Pen. no | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|
| Breed[a] | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| Production system[b] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pen pair, no. | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| Parasites[c] | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| Dietary intake, kg of dry matter IP1 | 6.323 | 5.812 | 6.245 | 6.134 | 5.745 | 5.837 | 5.489 | 5.380 |
| Dietary intake, % of liveweight IP1 | 2.357 | 2.629 | 2.481 | 2.542 | 2.429 | 2.534 | 2.485 | 3.003 |
| Intake of neutral detergent fiber, kg IP1 | 3.427 | 3.037 | 3.358 | 3.248 | 3.040 | 3.046 | 2.843 | 2.673 |
| Feed efficiency, ME MJ g gain$^{-1}$ IP1 | 62.88 | 62.98 | 65.19 | 60.88 | 59.67 | 56.91 | 56.79 | 58.30 |
| Dietary intake, kg of dry matter IP2 | 11.021 | 11.308 | 12.124 | 12.111 | 12.372 | 12.133 | 11.638 | 11.472 |
| Dietary intake, % of liveweight IP2 | 0.091 | 2.211 | 2.297 | 2.346 | 2.233 | 2.166 | 2.252 | 2.428 |
| Intake of neutral detergent fiber, kg IP2 | 7.047 | 5.969 | 6.491 | 6.485 | 6.724 | 6.526 | 6.348 | 6.261 |
| Feed efficiency, ME MJ g gain$^{-1}$ IP2 | 114.66 | 113.50 | 117.57 | 110.69 | 103.94 | 101.99 | 103.33 | 103.08 |
| Dietary intake, kg of dry matter IP3 | . | . | . | . | . | . | . | . |
| Dietary intake, % of liveweight IP3 | . | . | . | . | . | . | . | . |
| Intake of neutral detergent fiber, kg IP3 | . | . | . | . | . | . | . | . |
| Feed efficiency, ME MJ g gain$^{-1}$ IP3 | . | . | . | . | . | . | . | . |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.
[b]1 is spring-born, moderately high indoor feed intensity with 21 months slaughter age, 2 is autumn-born, low indoor feed intensity and 28 months slaughter age.
[c]1 is not infected, 2 is infected.

Table S1 cont.

| Pen. no | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|---|---|---|
| Breed[a] | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| Production system[b] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pen pair, no. | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| Parasites[c] | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| Dietary intake, kg of dry matter IP1 | 5.522 | 5.161 | 4.881 | 4.928 | 5.445 | 5.131 | 5.295 | 5.158 |
| Dietary intake, % of liveweight IP1 | 2.446 | 2.629 | 2.619 | 2.991 | 2.588 | 2.696 | 2.833 | 5.731 |
| Intake of neutral detergent fiber, kg IP1 | 2.898 | 2.613 | 2.428 | 2.376 | 2.838 | 2.592 | 2.696 | 2.531 |
| Feed efficiency, ME MJ g gain$^{-1}$ IP1 | 61.91 | 62.62 | 56.07 | 57.51 | 54.93 | 60.21 | 56.06 | 52.36 |
| Dietary intake, kg of dry matter IP2 | 10.619 | 9.174 | 9.165 | 9.456 | 10.995 | 8.659 | 9.850 | 9.339 |
| Dietary intake, % of liveweight IP2 | 2.255 | 2.245 | 2.159 | 2.298 | 2.363 | 2.094 | 2.286 | 2.433 |
| Intake of neutral detergent fiber, kg IP2 | 6.568 | 5.674 | 5.669 | 5.849 | 6.801 | 5.355 | 6.092 | 5.776 |
| Feed efficiency, ME MJ g gain$^{-1}$ IP2 | 115.75 | 124.67 | 118.33 | 119.35 | 133.61 | 117.25 | 120.09 | 126.10 |
| Dietary intake, kg of dry matter IP3 | 14.429 | 13.649 | 13.829 | 13.741 | 14.886 | 13.502 | 13.612 | 13.358 |
| Dietary intake, % of liveweight IP3 | 2.188 | 2.258 | 2.070 | 2.218 | 2.083 | 2.100 | 1.945 | 2.145 |
| Intake of neutral detergent fiber, kg IP3 | 7.820 | 7.398 | 7.518 | 7.469 | 8.190 | 7.434 | 7.699 | 7.587 |
| Feed efficiency, ME MJ g gain$^{-1}$ IP3 | 89.74 | 111.30 | 94.29 | 100.27 | 134.30 | 112.38 | 185.80 | 168.69 |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.

[b]1 is spring-born, moderately high indoor feed intensity with 21 months slaughter age, 2 is autumn-born, low indoor feed intensity and 28 months slaughter age.

[c]1 is not infected, 2 is infected.

Table S2. Individual data on purebred dairy and dairy x beef steers in forage and pasture-based production systems, where spring-born cattle were kept on a moderately high feed intensity and slaughtered at 21 months of age, while autumn-born cattle were kept on a low feed intensity and slaughtered at 28 months of age (IP = indoor period, GP = grazing period)

| Animal ID | 8247 | 8255 | 8271 | 8286 | 8244 | 8254 | 8276 | 8294 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 150418 | 150425 | 150505 | 150509 | 150415 | 150425 | 150506 | 150511 |
| Pen no. | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pair of calves, no | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Parasites[c] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight gain IP1, kg d$^{-1}$ | 1.210 | 1.072 | 1.115 | 0.991 | 0.987 | 0.982 | 1.045 | 1.066 |
| Weight gain GP1, kg d$^{-1}$ | 0.243 | 0.560 | 0.577 | 0.835 | 0.412 | 0.500 | 0.539 | 0.518 |
| Weight gain IP2, kg d$^{-1}$ | 1.175 | 1.349 | 1.198 | 1.127 | 1.063 | 1.012 | 0.944 | 1.123 |
| Weight gain GP2, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain IP3, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain total, kg d$^{-1}$ | 0.951 | 1.003 | 0.995 | 0.982 | 0.855 | 0.864 | 0.890 | 0.937 |
| Weight at slaughter, kg | 676.5 | 680.5 | 675.0 | 654.0 | 580.0 | 578.5 | 564.0 | 601.0 |
| Carcass weight, kg | 329.8 | 333.7 | 333.7 | 320.5 | 262.6 | 271.1 | 253.2 | 267.5 |
| Dressing, % | 48.8 | 49.0 | 49.4 | 49.0 | 45.3 | 46.9 | 44.9 | 44.5 |
| Conformation, score[d] | 5 | 6 | 5 | 6 | 3 | 4 | 4 | 4 |
| Fatness, score[e] | 7 | 6 | 8 | 7 | 6 | 7 | 6 | 6 |
| Marbling, score[f] | 2 | 1 | 2 | 1 | 3 | 1 | 2 | 1 |
| Weight of HQ[g], kg | 84 | 84.5 | 84.5 | 81.5 | 68.5 | 69.5 | 65.5 | 69 |
| Trim fat, % of HQ | 4.87 | 4.39 | 7.88 | 4.61 | 7.99 | 6.81 | 6.09 | 5.78 |
| Gr. 2 meat ass.[h], % of HQ | 22.1 | 23.1 | 20.6 | 22.2 | 20.2 | 20.0 | 20.6 | 21.6 |
| Gr. 3 meat ass.[i], % of HQ | 11.8 | 10.2 | 12.4 | 12.0 | 9.8 | 9.6 | 11.2 | 11.4 |
| Bone, % of HQ | 20.8 | 20.2 | 19.1 | 19.9 | 21.4 | 22.0 | 21.7 | 21.6 |
| Retail cuts[j], % of HQ | 37.2 | 38.8 | 35.3 | 37.8 | 36.4 | 37.8 | 36.6 | 35.2 |
| Slaughter age, d | 648 | 641 | 631 | 627 | 651 | 641 | 630 | 625 |
| Relative age[k], d | 3 | 10 | 20 | 24 | 0 | 10 | 21 | 26 |
| Initial weight IP1, kg | 157 | 132.5 | 131.5 | 117.5 | 112.5 | 106.5 | 77.5 | 89 |
| Initial weight GP1, kg | 494 | 431 | 442 | 393.5 | 387.5 | 380 | 368.5 | 386 |
| Initial weight IP2, kg | 528.5 | 510.5 | 524 | 512 | 446 | 451 | 445 | 459.5 |
| Initial weight GP2, kg | . | . | . | . | . | . | . | . |
| Initial weight IP3, kg | . | . | . | . | . | . | . | . |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.

[b]1 is spring-born, moderately high indoor feed intensity with 21 months slaughter age, 2 is autumn-born, low indoor feed intensity and 28 months slaughter age.

[c]1 is not infected, 2 is infected.

[d]EUROP system on a scale 1 = poor, 15 = excellent.

[e]EUROP system on a scale 1 = lean, 15 = fat.

[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

[i]Commercial cut meat assortment estimated to contain 23% fat.

[j]High-value retail cuts; strip loin, fillet, topside, outside round, eye of round, top rump, and rump steak

[k]Relative to the oldest animal in that production system group.

Table S2 cont.

| Animal ID | 8299 | 8301 | 8326 | 8332 | 8296 | 8298 | 8321 | 8329 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 150514 | 150515 | 150601 | 150603 | 150513 | 150515 | 150526 | 150602 |
| Pen no. | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pair of calves, no | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 |
| Parasites[c] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weight gain IP1, kg d$^{-1}$ | 1.016 | 1.079 | 1.002 | 1.110 | 1.178 | 1.164 | 1.081 | 1.027 |
| Weight gain GP1, kg d$^{-1}$ | 0.243 | 0.194 | 0.444 | 0.581 | 0.180 | 0.377 | 0.243 | 0.412 |
| Weight gain IP2, kg d$^{-1}$ | 1.230 | 1.140 | 0.988 | 0.910 | 1.320 | 1.099 | 0.991 | 1.118 |
| Weight gain GP2, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain IP3, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain total, kg d$^{-1}$ | 0.873 | 0.858 | 0.847 | 0.906 | 0.951 | 0.931 | 0.827 | 0.889 |
| Weight at slaughter, kg | 614.0 | 631.0 | 581.0 | 636.0 | 650.0 | 634.5 | 573.0 | 574.0 |
| Carcass weight, kg | 302.8 | 307.2 | 291.1 | 310.2 | 300.9 | 296.5 | 264.1 | 271.5 |
| Dressing, % | 49.3 | 48.7 | 50.1 | 48.8 | 46.3 | 46.7 | 46.1 | 47.3 |
| Conformation, score[d] | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| Fatness, score[e] | 8 | 8 | 9 | 9 | 8 | 9 | 9 | 8 |
| Marbling, score[f] | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| Weight of HQ[g], kg | 77.5 | 77.5 | 76 | 79.5 | 76 | 73.5 | 68.5 | 72 |
| Trim fat, % of HQ | 5.47 | 5.31 | 5.95 | 6.95 | 7.42 | 11.19 | 7.59 | 5.60 |
| Gr. 2 meat ass.[h], % of HQ | 20.4 | 21.1 | 20.2 | 19.9 | 20.0 | 19.6 | 19.8 | 20.0 |
| Gr. 3 meat ass.[i], % of HQ | 10.7 | 11.0 | 11.4 | 11.8 | 11.2 | 11.0 | 10.9 | 11.8 |
| Bone, % of HQ | 20.4 | 21.3 | 19.3 | 19.5 | 21.1 | 19.7 | 23.3 | 21.5 |
| Retail cuts[j], % of HQ | 39.7 | 38.1 | 38.9 | 38.7 | 36.3 | 35.2 | 35.6 | 37.9 |
| Slaughter age, d | 657 | 656 | 639 | 637 | 658 | 656 | 645 | 638 |
| Relative age[k], d | 29 | 30 | 47 | 49 | 28 | 30 | 41 | 48 |
| Initial weight IP1, kg | 155.5 | 180 | 136 | 160 | 150.5 | 145.5 | 139 | 107.5 |
| Initial weight GP1, kg | 381.5 | 420 | 359 | 407 | 412 | 404 | 379 | 335.5 |
| Initial weight IP2, kg | 416 | 447.5 | 422 | 489.5 | 437.5 | 457.5 | 413.5 | 394 |
| Initial weight GP2, kg | . | . | . | . | . | . | . | . |
| Initial weight IP3, kg | . | . | . | . | . | . | . | . |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.

[b]1 is spring-born, moderately high indoor feed intensity with 21 months slaughter age, 2 is autumn-born, low indoor feed intensity and 28 months slaughter age.

[c]1 is not infected, 2 is infected.

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[e]EUROP system on a scale 1 = lean, 15 = fat.

[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

[i]Commercial cut meat assortment estimated to contain 23% fat.

[j]High-value retail cuts; strip loin, fillet, topside, outside round, eye of round, top rump, and rump steak

[k]Relative to the oldest animal in that production system group.

Table S2 cont.

| Animal ID | 8338 | 8359 | 8383 | 8398 | 8336 | 8352 | 8371 | 8382 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 150606 | 150618 | 150629 | 150706 | 150604 | 150614 | 150625 | 150629 |
| Pen no. | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pair of calves, no | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 |
| Parasites[c] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight gain IP1, kg d$^{-1}$ | 1.243 | 1.205 | 1.070 | 0.734 | 1.302 | 1.115 | . | 1.005 |
| Weight gain GP1, kg d$^{-1}$ | 0.299 | 0.447 | 0.641 | 1.127 | 0.440 | 0.662 | . | 0.680 |
| Weight gain IP2, kg d$^{-1}$ | 1.339 | 1.208 | 1.339 | 1.068 | 1.429 | 1.071 | . | 1.182 |
| Weight gain GP2, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain IP3, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain total, kg d$^{-1}$ | 1.022 | 1.004 | 1.040 | 0.945 | 1.112 | 0.980 | | 0.974 |
| Weight at slaughter, kg | 684.5 | 676.0 | 681.0 | 607.5 | 727.0 | 643.5 | . | 621.0 |
| Carcass weight, kg | 327.8 | 338.1 | 323.9 | 293.5 | 333.2 | 299.9 | . | 289.6 |
| Dressing, % | 47.9 | 50.0 | 47.6 | 48.3 | 45.8 | 46.6 | . | 46.6 |
| Conformation, score[d] | 6 | 6 | 5 | 6 | 5 | 5 | . | 3 |
| Fatness, score[e] | 8 | 8 | 7 | 7 | 8 | 7 | . | 6 |
| Marbling, score[f] | 1 | 2 | 1 | 2 | 3 | 3 | . | 2 |
| Weight of HQ[g], kg | 86 | 88 | 86 | 77.5 | 84.5 | 78.5 | . | 74 |
| Trim fat, % of HQ | 7.67 | 9.84 | 6.10 | 6.87 | 9.07 | 7.62 | . | 7.03 |
| Gr. 2 meat ass.[h], % of HQ | 20.7 | 18.1 | 20.2 | 20.0 | 19.7 | 19.9 | . | 19.7 |
| Gr. 3 meat ass.[i], % of HQ | 10.3 | 11.0 | 11.3 | 10.8 | 11.6 | 12.0 | . | 10.8 |
| Bone, % of HQ | 20.5 | 19.8 | 20.1 | 20.1 | 20.7 | 21.2 | . | 21.9 |
| Retail cuts[j], % of HQ | 37.6 | 38.2 | 38.9 | 38.4 | 35.3 | 36.4 | . | 37.4 |
| Slaughter age, d | 641 | 629 | 618 | 611 | 643 | 633 | . | 618 |
| Relative age[k], d | 52 | 64 | 75 | 82 | 50 | 60 | . | 75 |
| Initial weight IP1, kg | 141 | 142 | 127.5 | 105 | 135.5 | 122 | . | 103 |
| Initial weight GP1, kg | 417 | 409.5 | 365 | 268 | 424.5 | 369.5 | . | 326 |
| Initial weight IP2, kg | 459.5 | 473 | 456 | 428 | 487 | 463.5 | . | 422.5 |
| Initial weight GP2, kg | . | . | . | . | . | . | . | . |
| Initial weight IP3, kg | . | . | . | . | . | . | . | . |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.

[b]1 is spring-born, moderately high indoor feed intensity with 21 months slaughter age, 2 is autumn-born, low indoor feed intensity and 28 months slaughter age.

[c]1 is not infected, 2 is infected.

[d]EUROP system on a scale 1 = poor, 15 = excellent.

[e]EUROP system on a scale 1 = lean, 15 = fat.

[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

[i]Commercial cut meat assortment estimated to contain 23% fat.

[j]High-value retail cuts; strip loin, fillet, topside, outside round, eye of round, top rump, and rump steak

[k]Relative to the oldest animal in that production system group.

Table S2 cont.

| Animal ID | 8400 | 8404 | 8406 | 8416 | 8394 | 8399 | 8409 | 8410 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 150708 | 150709 | 150710 | 150714 | 150705 | 150706 | 150711 | 150711 |
| Pen no. | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pair of calves, no | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 |
| Parasites[c] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weight gain IP1, kg d$^{-1}$ | 1.146 | 1.065 | 1.063 | 1.029 | . | 0.885 | 1.092 | 1.149 |
| Weight gain GP1, kg d$^{-1}$ | 0.356 | 0.229 | 0.486 | 0.239 | . | 0.405 | 0.451 | 0.423 |
| Weight gain IP2, kg d$^{-1}$ | 1.189 | 0.980 | 1.240 | 1.202 | . | 0.929 | 1.337 | 1.151 |
| Weight gain GP2, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain IP3, kg d$^{-1}$ | . | . | . | . | . | . | . | . |
| Weight gain total, kg d$^{-1}$ | 0.961 | 0.823 | 0.979 | 0.889 | . | 0.779 | 1.015 | 0.965 |
| Weight at slaughter, kg | 657.5 | 563.0 | 659.5 | 618.5 | . | 526.0 | 662.0 | 625.0 |
| Carcass weight, kg | 321.0 | 276.4 | 326.8 | 300.4 | . | 251.9 | 295.0 | 290.1 |
| Dressing, % | 48.8 | 49.1 | 49.6 | 48.6 | . | 47.9 | 44.6 | 46.4 |
| Conformation, score[d] | 5 | 4 | 5 | 4 | . | 4 | 4 | 4 |
| Fatness, score[e] | 9 | 8 | 9 | 8 | . | 9 | 9 | 8 |
| Marbling, score[f] | 2 | 1 | 1 | 1 | . | 3 | 1 | 2 |
| Weight of HQ[g], kg | 84.4 | 73.6 | 86 | 77.6 | . | 65.2 | 75.4 | 74.6 |
| Trim fat, % of HQ | 5.56 | 6.61 | 8.75 | 3.82 | . | 8.58 | 8.58 | 6.50 |
| Gr. 2 meat ass.[h], % of HQ | 19.8 | 20.0 | 17.9 | 21.0 | . | 18.2 | 18.5 | 18.9 |
| Gr. 3 meat ass.[i], % of HQ | 13.6 | 12.0 | 12.5 | 10.0 | . | 14.0 | 12.2 | 11.2 |
| Bone, % of HQ | 19.3 | 21.9 | 20.2 | 23.0 | . | 20.4 | 23.6 | 23.7 |
| Retail cuts[j], % of HQ | 38.2 | 37.4 | 36.7 | 38.3 | . | 35.1 | 36.2 | 36.6 |
| Slaughter age, d | 637 | 636 | 635 | 631 | . | 639 | 634 | 634 |
| Relative age[k], d | 84 | 85 | 86 | 90 | . | 82 | 87 | 87 |
| Initial weight IP1, kg | 119.5 | 102 | 111.5 | 120.5 | 74 | 90 | 93.5 | 84.5 |
| Initial weight GP1, kg | 374 | 338.5 | 347.5 | 349 | 246.5 | 286.5 | 336 | 339.5 |
| Initial weight IP2, kg | 424.5 | 371 | 416.5 | 383 | 313.5 | 344 | 400 | 399.5 |
| Initial weight GP2, kg | . | . | . | . | . | . | . | . |
| Initial weight IP3, kg | . | . | . | . | . | . | . | . |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.

[b]1 is spring-born, moderately high indoor feed intensity with 21 months slaughter age, 2 is autumn-born, low indoor feed intensity and 28 months slaughter age.

[c]1 is not infected, 2 is infected.

[d]EUROP system on a scale 1 = poor, 15 = excellent.

[e]EUROP system on a scale 1 = lean, 15 = fat.

[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

[i]Commercial cut meat assortment estimated to contain 23% fat.

[j]High-value retail cuts; strip loin, fillet, topside, outside round, eye of round, top rump, and rump steak

[k]Relative to the oldest animal in that production system group.

Table S2 cont.

| Animal ID | 8419 | 8423 | 8488 | 8491 | 8413 | 8414 | 8425 | 8476 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 150715 | 150717 | 150814 | 150817 | 150712 | 150712 | 150717 | 150807 |
| Pen no. | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pair of calves, no | 17 | 18 | 19 | 20 | 17 | 18 | 19 | 20 |
| Parasites[c] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weight gain IP1, kg d$^{-1}$ | 0.822 | 1.092 | 1.306 | 0.770 | 0.839 | 0.933 | 1.069 | 0.875 |
| Weight gain GP1, kg d$^{-1}$ | 0.299 | 0.194 | 0.468 | 0.651 | 0.137 | 0.532 | 0.482 | 0.183 |
| Weight gain IP2, kg d$^{-1}$ | 0.765 | 0.931 | 0.892 | 0.521 | 0.465 | 0.645 | 0.650 | 0.733 |
| Weight gain GP2, kg d$^{-1}$ | 0.451 | 0.260 | 0.383 | 0.532 | 0.120 | 0.438 | 0.286 | 0.695 |
| Weight gain IP3, kg d$^{-1}$ | 1.795 | 2.125 | 2.179 | 0.848 | . | 1.357 | 1.884 | 0.732 |
| Weight gain total, kg d$^{-1}$ | 0.698 | 0.769 | 0.887 | 0.627 | . | 0.704 | 0.736 | 0.655 |
| Weight at slaughter, kg | 635 | 739 | 825 | 581 | . | 652 | 683 | 597.5 |
| Carcass weight, kg | 289.1 | 362.6 | 388.1 | 292.0 | . | 294 | 315.6 | 275.4 |
| Dressing, % | 45.6 | 49.1 | 47.1 | 50.3 | . | 45.092 | 46.2 | 46.1 |
| Conformation, score[d] | 5 | 7 | 7 | 5 | . | 4 | 4 | 4 |
| Fatness, score[e] | 4 | 7 | 7 | 5 | . | 5 | 7 | 5 |
| Marbling, score[f] | 1 | 1 | 1 | 1 | . | 2 | 1 | 1 |
| Weight of HQ[g], kg | 73.8 | 92.8 | 96.8 | 71.4 | . | 72.4 | 77.4 | 68 |
| Trim fat, % of HQ | 4.58 | 8.73 | 8.64 | 4.85 | . | 8.12 | 9.07 | 6.71 |
| Gr. 2 meat ass.[h], % of HQ | 27.2 | 23.4 | 23.8 | 25.6 | . | 22.8 | 24.5 | 24.1 |
| Gr. 3 meat ass.[i], % of HQ | 4.8 | 7.0 | 6.9 | 5.7 | . | 6.0 | 5.3 | 5.7 |
| Bone, % of HQ | 21.5 | 19.9 | 20.5 | 21.0 | . | 22.2 | 21.3 | 22.0 |
| Retail cuts[j], % of HQ | 40.2 | 39.2 | 38.6 | 41.1 | . | 39.8 | 38.0 | 40.1 |
| Slaughter age, d | 861 | 859 | 831 | 828 | . | 864 | 859 | 838 |
| Relative age[k], d | 3 | 5 | 33 | 36 | . | 0 | 5 | 26 |
| Initial weight IP1, kg | 131 | 184.5 | 185 | 129 | 112.5 | 125 | 131.5 | 107 |
| Initial weight GP1, kg | 256 | 350.5 | 383.5 | 246 | 263.5 | 293 | 324 | 264.5 |
| Initial weight IP2, kg | 298.5 | 378 | 450 | 338.5 | 283 | 368.5 | 392.5 | 290.5 |
| Initial weight GP2, kg | 464.5 | 580 | 643.5 | 451.5 | 384 | 508.5 | 533.5 | 449.5 |
| Initial weight IP3, kg | 534 | 620 | 702.5 | 533.5 | 402.5 | 576 | 577.5 | 556.5 |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.

[b]1 is spring-born, moderately high indoor feed intensity with 21 months slaughter age, 2 is autumn-born, low indoor feed intensity and 28 months slaughter age.

[c]1 is not infected, 2 is infected.

[d]EUROP system on a scale 1 = poor, 15 = excellent.

[e]EUROP system on a scale 1 = lean, 15 = fat.

[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

[i]Commercial cut meat assortment estimated to contain 23% fat.

[j]High-value retail cuts; strip loin, fillet, topside, outside round, eye of round, top rump, and rump steak

[k]Relative to the oldest animal in that production system group.

Table S2 cont.

| Animal ID | 8499 | 8510 | 8525 | 8533 | 8485 | 8492 | 8511 | 8515 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 150820 | 150828 | 150904 | 150913 | 150812 | 150817 | 150828 | 150830 |
| Pen no. | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 24 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pair of calves, no | 21 | 22 | 23 | 24 | 21 | 22 | 23 | 24 |
| Parasites[c] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weight gain IP1, kg d$^{-1}$ | 1.158 | 0.865 | 0.888 | 1.049 | 0.789 | 1.217 | 0.901 | 1.026 |
| Weight gain GP1, kg d$^{-1}$ | 0.634 | 0.197 | 0.694 | 0.644 | 0.715 | 0.507 | 0.461 | 0.585 |
| Weight gain IP2, kg d$^{-1}$ | 0.813 | 0.548 | 0.680 | 0.583 | 0.696 | 0.712 | 0.645 | 0.631 |
| Weight gain GP2, kg d$^{-1}$ | 0.370 | 0.831 | 0.692 | 0.802 | 0.403 | 0.588 | 0.295 | 0.601 |
| Weight gain IP3, kg d$^{-1}$ | 1.685 | 1.446 | 1.482 | 1.738 | 1.351 | 1.696 | 1.321 | 1.565 |
| Weight gain total, kg d$^{-1}$ | 0.856 | 0.705 | 0.817 | 0.864 | 0.732 | 0.860 | 0.666 | 0.801 |
| Weight at slaughter, kg | 764.5 | 642 | 705.5 | 768 | 633 | 772 | 595 | 681 |
| Carcass weight, kg | 363.6 | 308.7 | 331.7 | 362.6 | 282.2 | 352.3 | 272 | 295 |
| Dressing, % | 47.6 | 48.1 | 47.0 | 47.2 | 44.6 | 45.6 | 45.7 | 43.3 |
| Conformation, score[d] | 7 | 7 | 6 | 7 | 5 | 4 | 4 | 4 |
| Fatness, score[e] | 7 | 7 | 7 | 8 | 7 | 8 | 7 | 6 |
| Marbling, score[f] | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 1 |
| Weight of HQ[g], kg | 93.6 | 79.8 | 84.8 | 94.4 | 72.4 | 88.4 | 69.2 | 75.2 |
| Trim fat, % of HQ | 8.31 | 6.37 | 7.74 | 8.22 | 8.20 | 10.02 | 10.55 | 7.69 |
| Gr. 2 meat ass.[h], % of HQ | 23.3 | 25.7 | 24.6 | 26.8 | 23.3 | 24.0 | 24.1 | 21.7 |
| Gr. 3 meat ass.[i], % of HQ | 6.4 | 5.6 | 5.0 | 5.0 | 5.6 | 5.2 | 5.7 | 7.0 |
| Bone, % of HQ | 19.7 | 20.1 | 21.0 | 18.7 | 21.3 | 21.4 | 19.2 | 21.8 |
| Retail cuts[j], % of HQ | 39.0 | 40.0 | 38.2 | 40.2 | 37.9 | 36.1 | 36.3 | 37.4 |
| Slaughter age, d | 853 | 845 | 838 | 829 | 861 | 856 | 845 | 843 |
| Relative age[k], d | 39 | 47 | 54 | 63 | 31 | 36 | 47 | 49 |
| Initial weight IP1, kg | 123.5 | 114 | 93.5 | 121 | 85 | 127.5 | 96 | 81 |
| Initial weight GP1, kg | 299.5 | 245.5 | 228.5 | 280.5 | 205 | 312.5 | 233 | 237 |
| Initial weight IP2, kg | 389.5 | 273.5 | 327 | 372 | 306.5 | 384.5 | 298.5 | 320 |
| Initial weight GP2, kg | 566 | 392.5 | 474.5 | 498.5 | 457.5 | 539 | 438.5 | 457 |
| Initial weight IP3, kg | 623 | 520.5 | 581 | 622 | 519.5 | 629.5 | 484 | 549.5 |

[a]1 is dairy x beef crossbreed, 2 is dairy breed.

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[c]1 is not infected, 2 is infected.

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[e]EUROP system on a scale 1 = lean, 15 = fat.

[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

[i]Commercial cut meat assortment estimated to contain 23% fat.

[j]High-value retail cuts; strip loin, fillet, topside, outside round, eye of round, top rump, and rump steak

[k]Relative to the oldest animal in that production system group.

Table S2 cont.

| Animal ID | 8540 | 8560 | 8577 | 8587 | 8522 | 8545 | 8559 | 8562 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 150913 | 150921 | 151003 | 151008 | 150902 | 150915 | 150920 | 150922 |
| Pen no. | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pair of calves, no | 25 | 26 | 27 | 28 | 25 | 26 | 27 | 28 |
| Parasites[c] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight gain IP1, kg d$^{-1}$ | 1.028 | 0.848 | 1.219 | 1.360 | 0.833 | 0.974 | 1.104 | 0.953 |
| Weight gain GP1, kg d$^{-1}$ | 0.835 | 0.937 | 0.746 | 0.782 | 0.683 | 0.859 | 0.648 | 0.637 |
| Weight gain IP2, kg d$^{-1}$ | 0.700 | 0.661 | 0.689 | 0.737 | 0.532 | 0.606 | 0.668 | 0.696 |
| Weight gain GP2, kg d$^{-1}$ | 1.136 | 1.175 | 1.169 | 1.448 | 0.721 | 0.692 | 0.347 | 0.370 |
| Weight gain IP3, kg d$^{-1}$ | 1.009 | 1.161 | 1.259 | 1.362 | 1.063 | 1.116 | 1.531 | 1.482 |
| Weight gain total, kg d$^{-1}$ | 0.804 | 0.815 | 0.798 | 0.857 | 0.725 | 0.802 | 0.788 | 0.771 |
| Weight at slaughter, kg | 749 | 693 | 746 | 816.5 | 685.5 | 710.5 | 715.5 | 683.5 |
| Carcass weight, kg | 369 | 339.6 | 367 | 417.5 | 308.7 | 333.7 | 321.4 | 304.3 |
| Dressing, % | 49.3 | 49.0 | 49.2 | 51.1 | 45.0 | 47.0 | 44.9 | 44.5 |
| Conformation, score[d] | 6 | 7 | 7 | 6 | 4 | 4 | 4 | 4 |
| Fatness, score[e] | 8 | 8 | 7 | 8 | 7 | 8 | 8 | 7 |
| Marbling, score[f] | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 |
| Weight of HQ[g], kg | 91 | 86.8 | 94.6 | 105.6 | 77.4 | 86.6 | 81.6 | 76.8 |
| Trim fat, % of HQ | 8.88 | 8.53 | 8.12 | 9.51 | 7.52 | 8.73 | 8.92 | 8.18 |
| Gr. 2 meat ass.[h], % of HQ | 23.5 | 25.5 | 24.4 | 23.7 | 23.0 | 21.2 | 24.6 | 26.0 |
| Gr. 3 meat ass.[i], % of HQ | 6.5 | 7.6 | 6.9 | 6.1 | 7.1 | 7.6 | 6.3 | 7.4 |
| Bone, % of HQ | 20.1 | 18.1 | 18.5 | 19.5 | 22.3 | 20.8 | 20.3 | 19.5 |
| Retail cuts[j], % of HQ | 32.6 | 36.8 | 38.9 | 38.1 | 36.1 | 38.3 | 36.7 | 36.1 |
| Slaughter age, d | 857 | 849 | 837 | 832 | 868 | 855 | 850 | 848 |
| Relative age[k], d | 63 | 71 | 83 | 88 | 52 | 65 | 70 | 72 |
| Initial weight IP1, kg | 175 | 111 | 176.5 | 204.5 | 163 | 132 | 147.5 | 127.5 |
| Initial weight GP1, kg | 266.5 | 186.5 | 285 | 325.5 | 243 | 225.5 | 253.5 | 219 |
| Initial weight IP2, kg | 385 | 319.5 | 391 | 436.5 | 340 | 347.5 | 345.5 | 309.5 |
| Initial weight GP2, kg | 537 | 463 | 540.5 | 596.5 | 455.5 | 479 | 490.5 | 460.5 |
| Initial weight IP3, kg | 636 | 563 | 605 | 664 | 566.5 | 585.5 | 544 | 517.5 |

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[c]1 is not infected, 2 is infected.

[d]EUROP system on a scale 1 = poor, 15 = excellent.

[e]EUROP system on a scale 1 = lean, 15 = fat.

[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

[i]Commercial cut meat assortment estimated to contain 23% fat.

[j]High-value retail cuts; strip loin, fillet, topside, outside round, eye of round, top rump, and rump steak

[k]Relative to the oldest animal in that production system group.

Table S2 cont.

| Animal ID | 8606 | 8620 | 8642 | 8646 | 8592 | 8600 | 8626 | 8636 |
|---|---|---|---|---|---|---|---|---|
| Date of birth | 151016 | 151026 | 151104 | 151107 | 151011 | 151014 | 151027 | 151101 |
| Pen no. | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 28 |
| Breed[a] | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Production system[b] | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pair of calves, no | 29 | 30 | 31 | 32 | 29 | 30 | 31 | 32 |
| Parasites[c] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight gain IP1, kg d$^{-1}$ | 1.135 | 1.185 | 1.006 | 0.949 | 1.177 | 1.182 | 0.906 | 1.238 |
| Weight gain GP1, kg d$^{-1}$ | 0.803 | 0.817 | 0.884 | 0.803 | 0.588 | 0.655 | 0.338 | 0.796 |
| Weight gain IP2, kg d$^{-1}$ | 0.643 | 0.825 | 0.654 | 0.657 | 0.654 | 0.601 | 0.523 | 0.730 |
| Weight gain GP2, kg d$^{-1}$ | 0.581 | 0.594 | 0.578 | 0.779 | 0.581 | 0.695 | 0.545 | 0.526 |
| Weight gain IP3, kg d$^{-1}$ | 0.449 | 0.891 | 0.833 | 0.963 | 0.776 | 0.602 | 0.874 | 1.133 |
| Weight gain total, kg d$^{-1}$ | 0.681 | 0.832 | 0.759 | 0.804 | 0.717 | 0.704 | 0.610 | 0.991 |
| Weight at slaughter, kg | 667.5 | 779.5 | 703 | 723.5 | 672 | 661.5 | 564 | 749 |
| Carcass weight, kg | 354.8 | 407.7 | 364.6 | 365.1 | 323.4 | 318 | 244 | 338.6 |
| Dressing, % | 53.2 | 52.3 | 51.9 | 50.5 | 48.1 | 48.1 | 43.3 | 45.2 |
| Conformation, score[d] | 6 | 7 | 6 | 6 | 4 | 3 | 2 | 3 |
| Fatness, score[e] | 7 | 8 | 8 | 6 | 7 | 7 | 6 | 6 |
| Marbling, score[f] | 3 | 3 | 2 | 1 | 5 | 3 | 2 | 1 |
| Weight of HQ[g], kg | 89.4 | 102.6 | 93.2 | 92.8 | 80 | 78.4 | 62.2 | 83.4 |
| Trim fat, % of HQ | 6.80 | 7.58 | 6.14 | 6.94 | 5.98 | 6.68 | 6.62 | 6.67 |
| Gr. 2 meat ass.[h], % of HQ | 19.3 | 18.5 | 19.7 | 23.0 | 18.1 | 17.9 | 19.3 | 21.1 |
| Gr. 3 meat ass.[i], % of HQ | 11.1 | 11.8 | 11.4 | 7.6 | 12.4 | 14.0 | 10.4 | 10.4 |
| Bone, % of HQ | 21.3 | 19.9 | 21.2 | 20.2 | 22.4 | 21.4 | 23.8 | 22.3 |
| Retail cuts[j], % of HQ | 38.2 | 38.3 | 37.9 | 38.7 | 36.9 | 36.2 | 35.7 | 35.6 |
| Slaughter age, d | 859 | 849 | 840 | 837 | 864 | 861 | 848 | 843 |
| Relative age[k], d | 96 | 106 | 115 | 118 | 91 | 94 | 107 | 112 |
| Initial weight IP1, kg | 157.5 | 156.5 | 134.5 | 121 | 130 | 129 | 103 | 128.5 |
| Initial weight GP1, kg | 258.5 | 262 | 224 | 205.5 | 243 | 242.5 | 190 | 230 |
| Initial weight IP2, kg | 372.5 | 378 | 349.5 | 319.5 | 326.5 | 335.5 | 238 | 343 |
| Initial weight GP2, kg | 512 | 557 | 491.5 | 462 | 468.5 | 466 | 351.5 | 501.5 |
| Initial weight IP3, kg | 601.5 | 648.5 | 580.5 | 582 | 558 | 573 | 435.5 | 582.5 |

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[f]Visually determined in *Musculus longissimus dorsi* between 10th and 11th ribs on a scale 1 = lean and 5 = well marbled.

[g]Right hind quarter.

[h]Commercial cut meat assortment estimated to contain 10% fat.

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