**Table S1**

Primary energy used by different inputs to produce 1 MJ metabolizable energy in delivered milk and meat gain. Values in MJ for each conventional (con) and organic (org) dairy farm and the average for both modes of production. Sorted by increasing energy intensity for all energy input.

| Inputs | Index | Mode of production | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | org | org | org | org | org | org | con | con | org | org | con | con | org | con | con | con | con | org | con | con | org aver. | con aver. |
| Concentrates | $I_{pa}$ | 0.404 | 0.556 | 0.417 | 0.629 | 0.434 | 0.625 | 0.714 | 1.014 | 0.500 | 0.435 | 0.557 | 0.821 | 0.598 | 0.750 | 0.834 | 0.868 | 0.665 | 0.603 | 0.730 | 0.870 | 0.520 | 0.782 |
| Milkpowder | $I_{pb}$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.064 | 0.000 | 0.000 | 0.070 | 0.027 | 0.000 | 0.011 | 0.001 | 0.005 | 0.054 | 0.000 | 0.009 | 0.003 | 0.000 | 0.025 |
| Imported roughage | $I_{pc}$ | 0.042 | 0.070 | 0.029 | 0.037 | 0.046 | 0.000 | 0.000 | 0.000 | 0.124 | 0.074 | 0.019 | 0.000 | 0.049 | 0.019 | 0.056 | 0.018 | 0.039 | 0.023 | 0.000 | 0.000 | 0.049 | 0.015 |
| Bought animals | $I_{pd}$ | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.008 | 0.000 | 0.001 | 0.015 | 0.037 | 0.000 | 0.018 | 0.004 | 0.005 | 0.000 | 0.016 | 0.007 | 0.000 | 0.002 | 0.019 | 0.007 | 0.007 |
| Entrepreneurial baling | $I_{pe}$ | 0.007 | 0.016 | 0.063 | 0.099 | 0.154 | 0.100 | 0.040 | 0.074 | 0.121 | 0.092 | 0.126 | 0.135 | 0.070 | 0.029 | 0.057 | 0.117 | 0.019 | 0.008 | 0.158 | 0.157 | 0.073 | 0.091 |
| PE-film | $I_{pf}$ | | | | | | | | | | | | | | | | | | | | | | |
| Fuel | $I_{pg}$ | 0.207 | 0.228 | 0.418 | 0.237 | 0.341 | 0.310 | 0.186 | 0.149 | 0.503 | 0.191 | 0.329 | 0.249 | 0.351 | 0.430 | 0.349 | 0.479 | 0.384 | 0.161 | 0.379 | 0.366 | 0.295 | 0.330 |
| Electricity | $I_{ph}$ | 0.258 | 0.339 | 0.334 | 0.563 | 0.475 | 0.422 | 0.355 | 0.218 | 0.426 | 0.477 | 0.331 | 0.292 | 0.294 | 0.401 | 0.385 | 0.276 | 0.286 | 0.546 | 0.373 | 0.313 | 0.413 | 0.323 |
| Silage additives | $I_{pi}$ | 0.084 | 0.000 | 0.039 | 0.077 | 0.000 | 0.000 | 0.098 | 0.011 | 0.044 | 0.000 | 0.082 | 0.024 | 0.160 | 0.096 | 0.115 | 0.000 | 0.094 | 0.000 | 0.040 | 0.128 | 0.040 | 0.069 |
| Pesticides, bedding, transport | $I_{pk} + I_{pl} + I_{pm}$ | 0.018 | 0.022 | 0.012 | 0.015 | 0.021 | 0.013 | 0.014 | 0.018 | 0.017 | 0.007 | 0.022 | 0.017 | 0.017 | 0.024 | 0.017 | 0.026 | 0.021 | 0.015 | 0.020 | 0.016 | 0.016 | 0.019 |
| Fertilizer and Lime | $I_{pn} + I_{po}$ | 0.013 | 0.000 | 0.003 | 0.005 | 0.004 | 0.000 | 0.200 | 0.242 | 0.077 | 0.000 | 0.354 | 0.303 | 0.050 | 0.358 | 0.395 | 0.437 | 0.577 | 0.000 | 0.578 | 0.553 | 0.015 | 0.400 |
| **Sum primary energy used by purchase** | $SI_{pDF}$ | **1.033** | **1.233** | **1.314** | **1.661** | **1.475** | **1.478** | **1.614** | **1.791** | **1.827** | **1.314** | **1.891** | **1.886** | **1.594** | **2.123** | **2.209** | **2.241** | **2.147** | **1.356** | **2.290** | **2.424** | **1.429** | **2.062** |
| Tractors and other machinery | $I_b$ | 0.448 | 0.283 | 0.398 | 0.162 | 0.369 | 0.400 | 0.267 | 0.186 | 0.235 | 0.557 | 0.228 | 0.294 | 0.530 | 0.320 | 0.254 | 0.402 | 0.336 | 0.821 | 0.541 | 0.706 | 0.420 | 0.353 |
| **Sum primary energy used by purchase, tractors and machinery** | $I_b + SI_{pDF}$ | **1.481** | **1.516** | **1.712** | **1.824** | **1.844** | **1.878** | **1.882** | **1.976** | **2.062** | **1.870** | **2.119** | **2.180** | **2.123** | **2.443** | **2.463** | **2.643** | **2.484** | **2.177** | **2.831** | **3.130** | **1.849** | **2.415** |
| Stables and other agric. buildings | $I_c$ | 0.169 | 0.273 | 0.238 | 0.135 | 0.175 | 0.190 | 0.158 | 0.155 | 0.099 | 0.336 | 0.115 | 0.173 | 0.291 | 0.158 | 0.162 | 0.102 | 0.175 | 0.446 | 0.164 | 0.211 | 0.235 | 0.157 |
| Production on free rangeland | $I_{FR}$ | 0.000 | 0.121 | 0.000 | 0.042 | 0.000 | 0.000 | 0.047 | 0.000 | 0.015 | 0.000 | 0.029 | 0.030 | 0.000 | 0.035 | 0.067 | 0.000 | 0.093 | 0.234 | 0.000 | 0.005 | 0.041 | 0.031 |
| **Sum primary energy used by all inputs** | $SI_{all}$ | **1.650** | **1.910** | **1.949** | **2.000** | **2.019** | **2.068** | **2.087** | **2.131** | **2.176** | **2.206** | **2.263** | **2.383** | **2.414** | **2.636** | **2.692** | **2.744** | **2.751** | **2.857** | **2.995** | **3.346** | **2.125** | **2.603** |