

**S4 Table. Air quality in barn 4 equipped with recirculating air filtration modules.**

| FP | Season | Week | No. of animals | °C indoors<br>± SD | °C outdoors<br>± SD | RH (% ± SD)     | Ventilation flow<br>(m <sup>3</sup> /h ± SD) | CO <sub>2</sub> (ppm ± SD) | NH <sub>3</sub> (ppm ± SD) | PM 1 (mg/m <sup>3</sup> ± SD) | PM 2.5 (mg/m <sup>3</sup> ± SD) | PM 4 (mg/m <sup>3</sup> ± SD) |
|----|--------|------|----------------|--------------------|---------------------|-----------------|--|----------------------------|----------------------------|-------------------------------|---------------------------------|-------------------------------|
| 1  | Autumn | 0    | 0              | 20.1 <sup>§</sup>  | 9.2 <sup>§</sup>    | na              | na   | na                         | na                         | 0.096 ± 0.007                 | 0.096 ± 0.008                   | 0.097 ± 0.008                 |
|    |        | 2    | 960            | 24.3 <sup>§</sup>  | 10.0 <sup>§</sup>   | na              | 12,976 <sup>§</sup>                          | 3,726 ± 190*               | 12.33 ± 0.8                | 0.110 ± 0.009                 | 0.113 ± 0.01                    | 0.120 ± 0.012                 |
|    |        | 4    | 960            | 24.5 ± 0.2         | 12.8 ± 0.3          | na              | 17,707 ± 1,745                               | 2,050 ± 163*               | 10.55 ± 0.1                | 0.036 ± 0.009                 | 0.039 ± 0.01                    | 0.045 ± 0.013                 |
|    |        | 6    | 944            | 23.9 ± 0.3         | 8.8 ± 0.6           | na              | 17,594 ± 999                                 | 2,698 ± 73*                | 17.05 ± 0.8                | 0.059 ± 0.009                 | 0.065 ± 0.01                    | 0.077 ± 0.013                 |
|    |        | 8    | 943            | 23.5 ± 0.3         | 7.8 ± 0.9           | na              | 17,144 ± 1,489                               | 3,142 ± 549*               | 15.90 ± 0.4                | 0.163 ± 0.045                 | 0.173 ± 0.049                   | 0.194 ± 0.055                 |
|    |        | 10   | na             | na                 | na                  | na              | na   | na                         | na                         | na                            | na                              | na                            |
|    |        | 12   | 832            | 22.8 ± 0.4         | 4.2 ± 0.8           | 71 ± 2          | 16,581 ± 1,185                               | 2,638 ± 245*               | 26.75 ± 7.4                | 0.076 ± 0.022                 | 0.084 ± 0.024                   | 0.102 ± 0.03                  |
| 2  | Winter | 0    | 0              | 19.7 ± 0.1         | 5.7 ± 1.0           | na              | na   | na                         | 16.55 ± 7.4                | 0.039 ± 0.011                 | 0.039 ± 0.011                   | 0.040 ± 0.012                 |
|    |        | 2    | 939            | 24.6 ± 0.2         | 4.3 ± 0.7           | 71 ± 2          | 14,553 ± 863                                 | 2,752 ± 171                | 8.65 ± 5.2                 | 0.041 ± 0.013                 | 0.047 ± 0.015                   | 0.056 ± 0.018                 |
|    |        | 4    | 934            | 23.7 <sup>§</sup>  | 7.9 <sup>§</sup>    | 66 <sup>§</sup> | 20,185 <sup>§</sup>                          | 2,111 <sup>§</sup>         | 14.95 ± 3.9                | 0.097 ± 0.022                 | 0.103 ± 0.024                   | 0.118 ± 0.03                  |
|    |        | 6    | 931            | 23.9 ± 0.2         | 7.2 ± 0.8           | 69 ± 3          | 16,806 ± 260                                 | 2,351 ± 84                 | 12.45 ± 2.3                | 0.055 ± 0.006                 | 0.060 ± 0.006                   | 0.068 ± 0.007                 |
|    |        | 8    | 928            | 25.3 ± 0.3         | 14.8 ± 2.1          | 66 ± 4          | 24,917 ± 1,073                               | 1,676 ± 317                | 19.65 ± 2.2                | 0.102 ± 0.025                 | 0.109 ± 0.028                   | 0.124 ± 0.034                 |
|    | Spring | 10   | 926            | 23.5 ± 0.3         | 8.5 ± 1.0           | 65 ± 4          | 17,707 ± 1,192                               | 1,830 ± 177                | 24.35 ± 0.1                | 0.072 ± 0.021                 | 0.079 ± 0.024                   | 0.095 ± 0.029                 |
|    |        | 12   | 832            | 23.4 ± 0.8         | 9.8 ± 1.0           | 68 ± 2          | 20,321 ± 3,848                               | 1,818 ± 193                | n.a.                       | 0.052 ± 0.002                 | 0.057 ± 0.002                   | 0.066 ± 0.003                 |
| 3  | Spring | 0    | 0              | 25.0 ± 0.1         | 18.5 ± 0.2          | na              | na   | na                         | na                         | 0.075 ± 0.002                 | 0.075 ± 0.003                   | 0.076 ± 0.002                 |
|    |        | 2    | 956            | 25.3 ± 0.2         | 17.4 ± 1.1          | 73 ± 1          | 18,969 ± 1,185                               | 1,497 ± 35                 | 9.45 ± 1.1                 | 0.026 ± 0.001                 | 0.028 ± 0.002                   | 0.032 ± 0.002                 |
|    |        | 4    | 950            | 25.8 ± 0.5         | 19.8 ± 1.6          | 68 ± 3          | 24,917 ± 2,341                               | 1,497 ± 64                 | 14.70 ± 1.6                | 0.036 ± 0.016                 | 0.039 ± 0.017                   | 0.045 ± 0.02                  |
|    |        | 6    | 948            | 31.6 ± 1.0         | 29.4 ± 1.5          | 64 ± 3          | 40,012 ± 0                                   | 1,199 ± 46                 | 13.50 ± 1.1                | 0.031 ± 0.008                 | 0.032 ± 0.008                   | 0.034 ± 0.01                  |
|    | Summer | 8    | 942            | 26.3 ± 0.5         | 21.5 ± 0.9          | 75 ± 1          | 36,633 ± 1,352                               | 1,250 ± 57                 | 15.55 ± 1.9                | 0.050 ± 0.009                 | 0.051 ± 0.008                   | 0.054 ± 0.006                 |
|    |        | 10   | 931            | 24.8 ± 0.3         | 14.8 ± 1.3          | 74 ± 2          | 26,854 ± 2,506                               | 1,997 ± 304                | 25.65 ± 3.9                | 0.028 ± 0.008                 | 0.031 ± 0.009                   | 0.035 ± 0.011                 |
|    |        | 12   | 916            | 27.9 ± 1.3         | 24.0 ± 1.8          | 70 ± 3          | 35,416 ± 225                                 | 1,334 ± 58                 | 20.35 ± 0.8                | 0.032 ± 0.008                 | 0.034 ± 0.009                   | 0.038 ± 0.01                  |

Measurements were taken at two week intervals and sampling was performed between 9 a.m. and 12 p.m.. Temperatures, relative humidity (RH), ventilation flow, and CO<sub>2</sub> represent the mean of data recorded during sampling time.

Dust values were calculated from data collected by the DustTrak™ DRX Aerosol Monitor over 10 min at two sampling points. NH<sub>3</sub> values are means of two measurements per barn.

Seasons were defined according to the astronomical calendar: spring (21st March to 20th June), summer (21st June to 22nd September), autumn (23rd September to 21st December), winter (22nd December to 20th March).

<sup>§</sup>data logging over time by the computer system failed and the given value represents a single value taken directly from the control panel in front of the barn

\*measured with a handheld device (Testo 535); FP - fattening period; na - data not available; SD - standard deviation; PM - particulate matter

<sup>#</sup>due to organizational reasons sampling at the abandoned barn was not possible