**Supplementary Material**

The hatching time of broiler chickens modifies not only the production traits, but also the bacteriota development in the ceca

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**Table S1.** The effect of hatching time and parent age on the caecal microbiota composition at the family level at 11 day of age.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Family (%)** |  | **Parent flock age** | |  | **FDR p-values** | | |
| **Hatching time** | **Young parent** | **Old parent** | **Average (Hatching time)** | **Hatching time** | **Parent flock age** | **Interaction** |
| *Ruminococcaceae* | Early | 35.051 | 33.467 | 34.259 | 0.443 |  | 0.635 |
| Late | 29.792 | 24.768 | 27.280 |
| Average (Age) | 32.422 | 29.118 |  | 0.750 | | |
| *Lachnospiraceae* | Early | 22.571 | 30.636 | 26.604 | 0.886 |  | 0.846 |
| Late | 27.650 | 23.050 | 25.350 |
| Average (Age) | 25.111 | 26.843 |  | 0.683 | | |
| *Lactobacillaceae* | Early | 14.110 | 12.439 | 13.275 | 0.504 |  | 0.729 |
| Late | 10.458 | 7.046 | 8.752 |
| Average (Age) | 12.284 | 9.743 |  | 0.717 | | |
| *Bacteroidaceae* | Early | 9.662 | 5.952 | 7.807 | 0.517 |  | 0.933 |
| Late | 12.424 | 27.494 | 19.959 |
| Average (Age) | 11.043 | 16.723 |  | 0.742 | | |
| *Erysipelotrichaceae* | Early | 4.533 | 5.118 | 4.826 | 0.542 |  | 0.425 |
| Late | 2.845 | 3.680 | 3.262 |
| Average (Age) | 3.689 | 4.399 |  | 0.702 | | |
| *Peptostreptococcaceae* | Early | 0.318 | 1.073 | 0.695 | 0.533 |  | 0.921 |
| Late | 0.232 | 0.372 | 0.302 |
| Average (Age) | 0.275 | 0.722 |  | 0.816 | | |
| *Clostridiales\_vadinBB60\_group* | Early | 3.098 | 5.917 | 4.508 | 0.294 |  | 0.634 |
| Late | 7.171 | 7.921 | 7.546 |
| Average (Age) | 5.135 | 6.919 |  | 0.849 | | |
| *Enterococcaceae* | Early | 0.435 | 1.172 | 0.804 | 0.849 |  | 0.707 |
| Late | 0.895 | 0.518 | 0.706 |
| Average (Age) | 0.665 | 0.845 |  | 0.695 | | |
| *Enterobacteriaceae* | Early | 0.153 | 0.420 | 0.287 | 0.365 |  | 1.447 |
| Late | 1.929 | 0.398 | 1.163 |
| Average (Age) | 1.041 | 0.409 |  | 0.965 | | |
| *Christensenellaceae* | Early | 0.192 | 0.124 | 0.158 | 0.589 |  | 0.553 |
| Late | 0.103 | 0.052 | 0.077 |
| Average (Age) | 0.148 | 0.088 |  | 0.700 | | |
| *Defluviitaleaceae* | Early | 0.108 | 0.124 | 0.116 | 0.959 |  | 0.914 |
| Late | 0.099 | 0.129 | 0.114 |
| Average (Age) | 0.103 | 0.127 |  | 0.699 | | |
| *Eggerthellaceae* | Early | 0.071 | 0.088 | 0.079 | 0.374 |  | 0.950 |
| Late | 0.040 | 0.063 | 0.051 |
| Average (Age) | 0.055 | 0.075 |  | 0.910 | | |
| *Family\_XIII* | Early | 0.075 | 0.064 | 0.070 | 0.708 |  | 0.912 |
| Late | 0.076 | 0.030 | 0.053 |
| Average (Age) | 0.076 | 0.047 |  | 0.832 | | |
| *Pseudomonadaceae* | Early | 0.006 | 0.008 | 0.007 | 0.502 |  | 0.736 |
| Late | 0.002 | 0.001 | 0.002 |
| Average (Age) | 0.004 | 0.005 |  | 0.916 | | |
| *Staphylococcaceae* | Early | 0.003 | 0.000 | 0.002 | 0.990 |  | 0.818 |
| Late | 0.004 | 0.000 | 0.002 |
| Average (Age) | 0.004 | 0.000 |  | 1.131 | | |
| *Anaeroplasmataceae* | Early | 3.444 | 1.118 | 2.281 | 0.513 |  | 0.850 |
| Late | 1.788 | 0.275 | 1.032 |
| Average (Age) | 2.616 | 0.697 |  | 0.526 | | |
| *Bacillaceae* | Early | 4.044 | 1.726 | 2.885 | 0.837 |  | 0.805 |
| Late | 3.246 | 3.838 | 3.542 |
| Average (Age) | 3.645 | 2.782 |  | 0.664 | | |
| *Clostridiaceae\_1* | Early | 0.257 | 0.222 | 0.239 | 0.888 |  | 0.411 |
| Late | 0.659 | 0.022 | 0.340 |
| Average (Age) | 0.458 | 0.122 |  | 0.669 | | |
| *Not\_Assigned* | Early | 1.560 | 0.149 | 0.854 | 0.535 |  | 0.895 |
| Late | 0.339 | 0.007 | 0.173 |
| Average (Age) | 0.950 | 0.078 |  | 0.805 | | |
| *Peptococcaceae* | Early | 0.027 | 0.012 | 0.019 | 0.835 |  | 0.692 |
| Late | 0.014 | 0.035 | 0.024 |
| Average (Age) | 0.020 | 0.023 |  | 0.913 | | |
| *Rikenellaceae* | Early | 0.001 | 0.000 | 0.001 | 0.720 |  | 0.970 |
| Late | 0.000 | 0.008 | 0.004 |
| Average (Age) | 0.001 | 0.004 |  | 0.680 | | |
| *Streptococcaceae* | Early | 0.000 | 0.043 | 0.021 | 0.595 |  | 1.116 |
| Late | 0.002 | 0.000 | 0.001 |
| Average (Age) | 0.001 | 0.021 |  | 0.680 | | |

**Table S2.** The effect of hatching time and parent age on the caecal microbiota composition at the family level at 39 day of age.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Family (%)** |  | **Parent flock age** | |  | **FDR p-values** | | |
| **Hatching time** | **Young parent** | **Old parent** | **Average (Hatching time)** | **Hatching time** | **Parent flock Age** | **Interaction** |
| *Ruminococcaceae* | Early | 29.016 | 28.005 | 28.510 | 0.911 |  | 0.762 |
| Late | 30.406 | 27.834 | 29.120 |
| Average (Age) | 29.711 | 27.919 |  | 0.639 | | |
| *Lachnospiraceae* | Early | 25.967 | 20.575 | 23.271 | 0.892 |  | 0.680 |
| Late | 23.783 | 26.714 | 25.249 |
| Average (Age) | 24.875 | 23.645 |  | 0.863 | | |
| *Lactobacillaceae* | Early | 25.336 | 32.926 | 29.131 | 0.735 |  | 0.657 |
| Late | 24.549 | 20.733 | 22.641 |
| Average (Age) | 24.943 | 26.830 |  | 0.861 | | |
| *Bacteroidaceae* | Early | 2.984 | 1.325 | 2.155 | 1.012 |  | 0.896 |
| Late | 2.628 | 1.709 | 2.169 |
| Average (Age) | 2.806 | 1.517 |  | 1.016 | | |
| *Erysipelotrichaceae* | Early | 2.016 | 1.862 | 1.939 | 0.613 |  | 0.785 |
| Late | 1.822 | 3.414 | 2.618 |
| Average (Age) | 1.919 | 2.638 |  | 0.979 | | |
| *Peptostreptococcaceae* | Early | 0.822 | 0.857 | 0.839 | 1.015 |  | 0.810 |
| Late | 1.401 | 2.214 | 1.807 |
| Average (Age) | 1.112 | 1.535 |  | 0.604 | | |
| *Clostridiales\_vadinBB60\_group* | Early | 3.259 | 2.806 | 3.032 | 0.963 |  | 0.853 |
| Late | 3.651 | 2.622 | 3.136 |
| Average (Age) | 3.455 | 2.714 |  | 0.720 | | |
| *Enterococcaceae* | Early | 0.081 | 0.482 | 0.282 | 0.862 |  | 0.789 |
| Late | 0.078 | 0.257 | 0.167 |
| Average (Age) | 0.080 | 0.370 |  | 0.647 | | |
| *Enterobacteriaceae* | Early | 0.142 | 0.113 | 0.128 | 0.689 |  | 0.824 |
| Late | 0.449 | 0.335 | 0.392 |
| Average (Age) | 0.296 | 0.224 |  | 0.844 | | |
| *Christensenellaceae* | Early | 1.529 | 0.976 | 1.252 | 0.847 |  | 0.739 |
| Late | 1.256 | 1.703 | 1.479 |
| Average (Age) | 1.392 | 1.340 |  | 0.951 | | |
| *Defluviitaleaceae* | Early | 0.185 | 0.100 | 0.142 | 0.938 |  | 0.488 |
| Late | 0.117 | 0.152 | 0.135 |
| Average (Age) | 0.151 | 0.126 |  | 0.628 | | |
| *Eggerthellaceae* | Early | 0.021 | 0.029 | 0.025 | 0.858 |  | 0.814 |
| Late | 0.017 | 0.042 | 0.030 |
| Average (Age) | 0.019 | 0.035 |  | 1.921 | | |
| *Family\_XIII* | Early | 0.220 | 0.234 | 0.227 | 0.575 |  | 0.675 |
| Late | 0.131 | 0.218 | 0.174 |
| Average (Age) | 0.175 | 0.226 |  | 0.639 | | |
| *Pseudomonadaceae* | Early | 0.000 | 0.005 | 0.002 | 0.957 |  | 0.803 |
| Late | 0.002 | 0.003 | 0.003 |
| Average (Age) | 0.001 | 0.004 |  | 0.588 | | |
| *Staphylococcaceae* | Early | 0.004 | 0.000 | 0.002 | 0.860 |  | 0.925 |
| Late | 0.012 | 0.003 | 0.007 |
| Average (Age) | 0.008 | 0.001 |  | 0.755 | | |
| *Anaeroplasmataceae* | Early | 0.008 | 0.063 | 0.036 | 0.812 |  | 0.828 |
| Late | 0.002 | 0.034 | 0.018 |
| Average (Age) | 0.005 | 0.049 |  | 0.844 | | |
| *Bacillaceae* | Early | 1.465 | 2.362 | 1.914 | 0.884 |  | 0.647 |
| Late | 1.671 | 0.717 | 1.194 |
| Average (Age) | 1.568 | 1.540 |  | 0.966 | | |
| *Clostridiaceae\_1* | Early | 0.000 | 0.007 | 0.003 | 0.953 |  | 0.842 |
| Late | 0.033 | 0.216 | 0.124 |
| Average (Age) | 0.016 | 0.112 |  | 0.605 | | |
| *Not\_Assigned* | Early | 0.849 | 0.962 | 0.906 | 0.878 |  | 0.762 |
| Late | 1.136 | 0.949 | 1.042 |
| Average (Age) | 0.992 | 0.955 |  | 0.965 | | |
| *Peptococcaceae* | Early | 0.514 | 0.423 | 0.469 | 0.880 |  | 0.767 |
| Late | 0.594 | 0.425 | 0.510 |
| Average (Age) | 0.554 | 0.424 |  | 0.742 | | |
| *Rikenellaceae* | Early | 0.018 | 0.003 | 0.010 | 0.814 |  | 0.650 |
| Late | 0.003 | 0.007 | 0.005 |
| Average (Age) | 0.011 | 0.005 |  | 0.576 | | |
| *Streptococcaceae* | Early | 0.426 | 0.044 | 0.235 | 0.747 |  | 0.695 |
| Late | 0.589 | 1.844 | 1.217 |
| Average (Age) | 0.508 | 0.944 |  | 0.622 | | |