|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Milk yield | | | | | | | | | | | |
|  | Holstein | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | ns | ns | \*\*\*\* | \*\*\*\* | \*\* | \*\*\*\* | ns | ns | \*\* | ns | ns | ns |
| M2 | \*\* | \*\* | \* | \* | \*\*\*\* | \*\* | \*\* | \* | \* | \* | ns | ns |
| M3 | ns | ns | ns | ns | \*\*\*\* | \*\*\* | \*\* | \* | ns | ns | \* | ns |
| M4 | ns | ns | ns | ns | \* | \*\*\* | \*\* | ns | ns | ns | ns | ns |
| M5 | ns | ns | \*\* | ns | ns | ns | ns | \* | ns | \* | \*\* | \* |
| M6 | \*\* | \* | ns | ns | ns | \*\*\* | ns | ns | ns | ns | ns | \*\*\*\* |
| M7 | ns | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | \* | \*\* |
| M8 | ns | ns | ns | \* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | ns |
| M9 | ns | ns | \*\* | \*\*\* | \*\*\*\* | \*\* | ns | ns | ns | ns | ns | ns |
| M95 | ns | ns | \* | \*\*\*\* | \*\*\* | ns | ns | \* | ns | ns | ns | \*\*\* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fat yield | | | | | | | | | | | |
|  | Holstein | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | ns | ns | \*\* | \*\*\*\* | \* | \*\*\* | ns | ns | \* | ns | ns | ns |
| M2 | \* | \* | ns | ns | \* | ns | \* | \* | \*\* | \* | ns | ns |
| M3 | ns | ns | ns | ns | \*\*\* | ns | ns | ns | ns | ns | ns | ns |
| M4 | \* | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns |
| M5 | ns | ns | \*\* | ns | ns | \*\*\* | ns | \* | ns | ns | ns | ns |
| M6 | \*\* | \* | ns | ns | ns | \*\*\*\* | ns | ns | ns | ns | ns | \* |
| M7 | ns | ns | ns | ns | \*\*\* | \*\*\*\* | \* | \* | ns | ns | \*\* | \*\* |
| M8 | ns | ns | ns | ns | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | ns |
| M9 | ns | ns | \* | \*\* | \*\*\* | ns | ns | ns | ns | ns | ns | ns |
| M95 | ns | ns | ns | \*\* | \* | ns | ns | \* | ns | ns | ns | \*\* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Protein yield | | | | | | | | | | | |
|  | Holstein | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | \*\* | ns | \* | ns |
| M2 | \*\* | \*\*\* | \*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | \*\* | \*\* | \* | \* |
| M3 | ns | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | \* | \* | ns | ns | \*\* | ns |
| M4 | \* | ns | ns | ns | \*\* | \*\*\* | \*\* | ns | ns | ns | ns | ns |
| M5 | ns | ns | \*\*\*\* | ns | ns | \*\* | ns | \*\* | ns | ns | \* | ns |
| M6 | \*\*\* | \*\* | ns | \* | \*\* | \*\*\*\* | ns | \* | ns | ns | ns | \*\*\* |
| M7 | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | \*\* | \*\*\* |
| M8 | ns | ns | \* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | \* | \*\* |
| M9 | ns | ns | \*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | \* | ns | ns | ns |
| M95 | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | \* | ns | \* | ns | ns | ns | \* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Somatic cell score | | | | | | | | | | | |
|  | Holstein | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | ns | \* | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \* | \* | ns | ns | \*\* | \*\* |
| M2 | \*\* | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | ns | \* | \*\*\* | \*\*\*\* |
| M3 | \* | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | ns | \* | \*\* | \*\* |
| M4 | ns | ns | ns | \* | ns | ns | ns | ns | ns | ns | \*\* | ns |
| M5 | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns |
| M6 | \*\*\* | \* | \*\*\* | \*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | \*\* | ns | ns |
| M7 | \*\*\* | \* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | ns | ns | \*\* | \* |
| M8 | ns | ns | \*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \* | ns | ns | ns | \*\*\* | \*\*\*\* |
| M9 | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M95 | ns | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | \*\* | \*\*\*\* | \*\*\*\* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Height at sacrum | | | | | | | | | | | |
|  | Holstein | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | ns | ns | ns | ns | ns | ns | \*\* | ns | ns | \*\*\* | \*\*\*\* | \*\*\*\* |
| M2 | \*\* | \*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\* | ns | \*\* | \* | \* | ns |
| M3 | \*\* | \*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | \* | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M4 | \*\*\* | \*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M5 | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M6 | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \* | \* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M7 | \*\* | \* | \*\* | ns | ns | ns | ns | ns | ns | \*\*\* | \* | \*\* |
| M8 | ns | ns | \*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \* | ns | ns | ns | \* | \*\*\* |
| M9 | \* | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | \* | \*\*\*\* | \*\*\*\* |
| M95 | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Body depth | | | | | | | | | | | |
|  | Holstein | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | \* | ns | ns | \*\* | \* | \*\* | ns | ns | ns | \* | \*\* | \*\*\*\* |
| M2 | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | ns | ns | ns | \* |
| M3 | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | ns | ns | ns |
| M4 | \*\* | \*\* | \* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \* | ns | \*\* | \*\*\* | \*\*\*\* | \*\*\*\* |
| M5 | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\* | ns | ns | \* | \*\*\*\* | \*\*\*\* |
| M6 | ns | ns | ns | ns | \* | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M7 | \* | ns | \*\*\* | \*\* | \*\*\* | \*\*\* | \* | ns | ns | \* | ns | ns |
| M8 | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | \* |
| M9 | \*\* | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | \* | \*\* |
| M95 | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | \* | ns | ns | \* | \*\*\* | \*\*\* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Chest width | | | | | | | | | | | |
|  | Holstein | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | \* | ns | ns | ns | \* | ns | ns | ns | \* | ns | \*\* | \*\* |
| M2 | \* | \*\* | \*\* | \*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | \* |
| M3 | ns | ns | \*\*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | ns |
| M4 | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | ns |
| M5 | ns | ns | ns | \*\*\* | \*\*\*\* | \*\*\*\* | \* | \* | ns | ns | ns | ns |
| M6 | ns | ns | ns | \* | \*\*\* | \*\*\* | ns | ns | \*\* | \*\*\* | \*\* | \*\*\* |
| M7 | ns | ns | ns | ns | ns | ns | ns | ns | \*\* | \*\*\* | \*\*\*\* | \*\*\* |
| M8 | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | ns |
| M9 | ns | ns | \* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | ns |
| M95 | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* | ns | ns | ns | ns | ns | ns |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Body condition score | | | | | |
|  | Holstein | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | ns | ns | ns | ns | ns | ns |
| M2 | ns | \* | ns | \*\* | \*\* | ns |
| M3 | ns | ns | \*\*\* | \*\*\*\* | \*\*\*\* | \*\*\* |
| M4 | ns | ns | \*\* | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M5 | ns | ns | ns | \* | \*\*\*\* | \*\*\*\* |
| M6 | ns | ns | \* | ns | ns | \*\* |
| M7 | \* | \*\* | \*\*\*\* | \*\* | \*\* | \* |
| M8 | ns | ns | ns | \*\* | \*\*\*\* | \*\*\*\* |
| M9 | ns | ns | ns | \*\*\*\* | \*\*\*\* | \*\*\*\* |
| M95 | ns | ns | ns | ns | \*\*\*\* | \*\*\*\* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Muscularity at thighs | | | | | | Muscularity at withers | | | | | |
|  | Montbeliarde | | | | | | Montbeliarde | | | | | |
|  | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] | [20;40] | ]40;45] | ]50;55] | ]55;60] | ]60;65] | ]65;80] |
| M1 | ns | ns | ns | ns | ns | \*\*\* | ns | ns | \*\* | ns | ns | ns |
| M2 | \*\* | \* | ns | \* | \*\*\*\* | \* | \*\* | ns | ns | \* | ns | ns |
| M3 | ns | ns | ns | ns | ns | ns | \* | ns | ns | ns | ns | ns |
| M4 | ns | ns | ns | \* | \*\* | ns | \*\*\* | ns | ns | ns | \*\* | ns |
| M5 | \* | \*\*\*\* | ns | ns | ns | \*\*\* | ns | \* | ns | ns | \* | \*\* |
| M6 | \* | ns | ns | ns | ns | \*\* | ns | ns | ns | \* | ns | \*\* |
| M7 | ns | ns | \* | \* | \*\* | ns | ns | ns | \* | \* | \*\* | ns |
| M8 | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns |
| M9 | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | \* | ns |
| M95 | \* | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns |

**Table S2.** p-values associated to the effect of the average temperature-humidity index (THI) by month of gestation of the dam, from M1 (d1 to d30) to M9 (d241 to d270) and M9.5 (d250-d279). For each trait, results are given by breed and by class of the average THI.

\*: p ≤ 0.05; \*\*: p ≤ 0.01; \*\*\*: p ≤ 0.001; \*\*\*\*: p ≤ 0.0001; ns: p > 0.05