### Table S1. The effect of different factors on reproductive performance traits

| Traits | Herd | Year | Season | Parity |
|--------|------|------|--------|--------|
|        | Df   | F\(^1\) | Df | F | Df | F | Df | F |
| TNB    | 1    | 16.84** | 9 | 33.97** | 3 | 3.73* | 7 | 49.02** |
| NBA    | 1    | 0.07  | 9 | 22.06** | 3 | 2.27  | 7 | 43.98** |
| LBW    | 1    | 94.34** | 9 | 29.26** | 3 | 3.21* | 7 | 129.59** |
| ABW    | 1    | 558.97** | 9 | 53.12** | 3 | 15.02** | 7 | 114.36** |
| GL     | 1    | 121.23** | 9 | 74.29** | 3 | 1.15  | 7 | 31.24** |
| AFS    | 1    | 30.15** | 9 | 21.29** | 3 | 21.39** |
| AFF    | 1    | 34.66** | 9 | 21.14** | 3 | 22.32** |

TNB, total number born; NBA, number born alive; LBW, litter birth weight; ABW, average birth weight; GL, gestation length; AFS, age at first service; AFF, age at first farrowing; Df, degree of freedom.

\(^1\)The effects of herds, years, seasons, and parities on reproductive traits. *\(p<0.05\), **\(p<0.01\).
### Table S2. The effect of herds on reproductive performance traits

| Herd | TNB (each) | NBA (each) | LBW (kg) | ABW (kg) | GL (day) | AFS (day) | AFF (day) |
|------|------------|------------|----------|----------|----------|-----------|-----------|
| 1    | 10.31±2.96 | 9.98±2.94  | 14.61±4.24 | 1.48±0.23 | 114.95±1.74 | 277.81±49.43 | 392.75±49.6 |
|      | (8250, 43.69%)<sup>a</sup> | (8181, 43.72%)<sup>3</sup> | (7669, 43.86%)<sup>4</sup> | (8290, 43.67%)<sup>a</sup> | (1717, 39.36%)<sup>a</sup> | (1717, 39.36%)<sup>a</sup> |
| 2    | 10.56±2.80 | 10.11±2.62 | 14.13±3.75 | 1.40±0.19 | 115.21±1.86 | 285.3451.99 | 401.08±52.04 |
|      | (10633, 56.31%)<sup>b</sup> | (1053, 56.28%) | (9815, 56.14%)<sup>b</sup> | (9815, 56.14%)<sup>b</sup> | (10692, 56.33%)<sup>b</sup> | (2645, 60.64%)<sup>b</sup> | (2645, 60.64%)<sup>b</sup> |

TNB, total number born; NBA, number born alive; LBW, litter birth weight; ABW, average birth weight; GL, gestation length; AFS, age at first service; AFF, age at first farrowing.

1) The unit of traits are shown in parentheses.

2) Phenotypic data of different herds are displayed by mean±standard deviation;

3) The number of individuals and frequencies in different herds are shown in parentheses, respectively;

4) Different superscript letters (a, b) in the same column mean significant differences (P<0.05).
Table S3. The effect of years on reproductive performance traits

| Year | TNB (each)\(^1\) | NBA (each) | LBW (kg) | ABW (kg) | GL (day) | AFS (day) | AFF (day) |
|------|-------------------|------------|----------|----------|----------|----------|----------|
| 2007 | 10.44±3.19\(^2\)  | 9.97±3.08  | 14.52±4.82 | 1.46±0.24 | 115.33±1.91 | 285.53±51 | 400.94±51.13 |
|      | (2133, 11.30%)\(^a\) | (2119, 11.32%)\(^3\) | (1926, 11.02%)\(^b\|^\(\) | (1926, 11.02%)\(^a\)^\(\) | (2119, 11.16%)\(^a\)^\(bc\) | (791, 18.13%)\(^a\)^\(cd\) | (791, 18.13%)\(^a\)^\(cd\) |
| 2008 | 10.19±2.89        | 9.85±2.84  | 14.82±4.29 | 1.51±0.18 | 115.03±1.78 | 292.61±54.47 | 407.62±54.6 |
|      | (1494, 7.91%)\(^b\) | (1485, 7.94%)\(^b\) | (1395, 7.98%)\(^c\) | (1395, 7.98%)\(^b\) | (1504, 7.92%)\(^d\) | (319, 7.31%)\(^a\) | (319, 7.31%)\(^a\) |
| 2009 | 10.33±3.00        | 9.93±2.9   | 14.37±4.05 | 1.47±0.24 | 115.26±1.72 | 301.51±57.05 | 416.63±57.4 |
|      | (1723, 9.12%)\(^ab\) | (1705, 9.11%)\(^ab\) | (1609, 9.20%)\(^abcd\) | (1609, 9.20%)\(^abc\) | (1741, 9.17%)\(^ab\) | (235, 5.39%)\(^b\) | (235, 5.39%)\(^b\) |
| 2010 | 10.35±2.95        | 10.02±2.9  | 14.16±4.05 | 1.42±0.24 | 115.09±1.86 | 291.85±52.46 | 407.28±52.55 |
|      | (1839, 9.74%)\(^ab\) | (1823, 9.74%)\(^a\) | (1676, 9.59%)\(^d\) | (1676, 9.59%)\(^d\) | (1853, 9.76%)\(^d\) | (323, 7.40%)\(^a\) | (323, 7.40%)\(^a\) |
| 2011 | 10.08±3.01        | 9.77±3     | 13.89±4.15 | 1.44±0.24 | 115.42±1.78 | 279.08±51.63 | 394.53±51.74 |
|      | (1552, 8.22%)\(^b\) | (1541, 8.23%)\(^b\) | (1421, 8.13%)\(^e\) | (1421, 8.13%)\(^e\) | (1564, 8.24%)\(^e\) | (347, 7.96%)\(^d\) | (347, 7.96%)\(^d\) |
| 2012 | 9.82±2.88         | 9.5±2.85   | 13.37±3.92 | 1.42±0.2  | 115.34±1.67 | 289.12±56.46 | 404.77±56.66 |
|      | (1892, 10.02%)\(^c\) | (1874, 10.01%)\(^c\) | (1732, 9.91%)\(^f\) | (1732, 9.91%)\(^f\) | (1911, 10.07%)\(^bc\) | (451, 10.34%)\(^ac\) | (451, 10.34%)\(^ac\) |
| 2013 | 10.32±2.83        | 10.03±2.78 | 14.18±3.89 | 1.42±0.2  | 115.37±1.89 | 269.21±45.97 | 385.29±45.95 |
|      | (1994, 10.56%)\(^ab\) | (1960, 10.47%)\(^a\) | (1888, 10.80%)\(^d\) | (1888, 10.80%)\(^d\) | (2007, 10.57%)\(^ac\) | (496, 11.37%)\(^c\) | (496, 11.37%)\(^c\) |
| Year | TNB  | NBA  | LBW  | ABW  | GL  | AFS  | AFF  |
|------|------|------|------|------|-----|------|------|
| 2014 | 10.68±2.43 | 10.3±2.3 | 14.26±3.35 | 1.39±0.16 | 115.22±1.72 | 282.37±50.77 | 398.14±50.89 |
|      | (2472, 13.09%)<sup>d</sup> | (2447, 13.08%)<sup>d</sup> | (2374, 13.58%)<sup>ad</sup> | (2374, 13.58%)<sup>f</sup> | (2481, 13.07%)<sup>e</sup> | (707, 16.21%)<sup>ed</sup> | (707, 16.21%)<sup>ed</sup> |
| 2015 | 11.20±2.73 | 10.58±2.53 | 14.59±3.4 | 1.39±0.17 | 114.51±1.74 | 279.05±40.93 | 394.01±41 |
|      | (2136, 11.31%)<sup>c</sup> | (2125, 11.36%)<sup>c</sup> | (2072, 11.85%)<sup>bc</sup> | (2072, 11.85%)<sup>f</sup> | (2146, 11.31%)<sup>f</sup> | (341, 7.82%)<sup>d</sup> | (341, 7.82%)<sup>yd</sup> |
| 2016 | 10.94±2.59 | 10.35±2.4 | 15.43±3.63 | 1.47±0.22 | 114.361.68 | 260.9438.75 | 375.55±38.89 |
|      | (1648, 8.73%)<sup>f</sup> | (1634, 8.73%)<sup>d</sup> | (1391, 7.96%)<sup>g</sup> | (1391, 7.96%)<sup>e</sup> | (1656, 8.72%)<sup>f</sup> | (352, 8.07%)<sup>f</sup> | (352, 8.07%)<sup>f</sup> |

TNB, total number born; NBA, number born alive; LBW, litter birth weight; ABW, average birth weight; GL, gestation length; AFS, age at first service; AFF, age at first farrowing.

1) The unit of traits are shown in parentheses.

2) Phenotypic data of different years are displayed by mean±standard deviation;

3) The number of individuals and frequencies in different years are shown in parentheses, respectively;

4) Different superscript letters (a, b, c, d, e, f, g) in the same column mean significant differences ($P<0.05$).
| Season | TNB (each) | NBA (each) | LBW (kg) | ABW (kg) | GL (day) | AFS (day) | AFF (day) |
|--------|------------|------------|----------|----------|----------|-----------|-----------|
| Spring | 10.54±2.84 | 10.11±2.76 | 14.43±3.96 | 1.43±0.21 | 115.09±1.78 | 283.67±51.54 | 399.12±51.76 |
|        | (4684, 24.81%) | (4640, 24.80%) | (4371, 25.00%) | (4371, 25.00%) | (4692, 24.72%) | (1164, 26.69%) | (1164, 26.69%) |
| Summer | 10.37±2.84 | 9.97±2.73  | 14.38±4   | 1.45±0.21 | 115.08±1.81 | 276.4±48.94  | 391.63±49.05 |
|        | (5250, 27.80%) | (5208, 27.83%) | (4823, 27.59%) | (4823, 27.59%) | (5269, 27.76%) | (1293, 29.64%) | (1293, 29.64%) |
| Autumn | 10.42±2.83 | 10.03±2.74 | 14.21±3.94 | 1.42±0.21 | 115.14±1.81 | 280.7±50.03  | 396.15±50.1 |
|        | (4494, 23.80%) | (4444, 23.75%) | (4135, 23.65%) | (4135, 23.65%) | (4529, 23.86%) | (1028, 23.57%) | (1028, 23.57%) |
| Winter | 10.51±2.99 | 10.1±2.85 | 14.32±4.02 | 1.43±0.21 | 115.081.85 | 291.4±53.64  | 407.12±53.65 |
|        | (4455, 23.59%) | (4421, 23.63%) | (4155, 23.76%) | (4155, 23.76%) | (4492, 23.66%) | (877, 20.11%) | (877, 20.11%) |

TNB, total number born; NBA, number born alive; LBW, litter birth weight; ABW, average birth weight; GL, gestation length; AFS, age at first service; AFF, age at first farrowing.

1) The unit of traits are shown in parentheses.

2) Phenotypic data of different seasons are displayed by mean±standard deviation; 

3) The number of individuals and frequencies in different seasons are shown in parentheses, respectively; 

4) Different superscript letters (a, b, c) in the same column mean significant differences ($P<0.05$).
Table S5. The effect of parities on reproductive performance traits

| Parity | TNB (each) | NBA (each) | LBW (kg) | ABW (kg) | GL (day) |
|--------|------------|------------|----------|----------|----------|
| 1      | 9.96±2.67  | 9.63±2.6   | 13.06±3.74 | 1.36±0.2 | 115.45±1.88 |
|   (4751, 25.16%) | (4661, 24.91%) | (4304, 24.62%) | (4304, 24.62%) | (4772, 25.14%) |
| 2      | 10.43±2.9  | 10.07±2.79 | 14.68±3.93 | 1.47±0.21 | 115.12±1.78 |
|   (3602, 19.08%) | (3580, 19.13%) | (3405, 19.47%) | (3405, 19.47%) | (3627, 19.11%) |
| 3      | 10.83±2.93 | 10.41±2.82 | 15.2±3.95  | 1.47±0.21 | 114.96±1.75 |
|   (2909, 15.41%) | (2897, 15.48%) | (2783, 15.92%) | (2783, 15.92%) | (2917, 15.37%) |
| 4      | 11.01±3.03 | 10.5±2.86  | 15.23±4.02 | 1.46±0.21 | 114.87±1.72 |
|   (2292, 12.14%) | (2282, 12.19%) | (2188, 12.51%) | (2188, 12.51%) | (2301, 12.12%) |
| 5      | 10.85±2.84 | 10.42±2.74 | 14.99±3.83 | 1.45±0.21 | 114.83±1.85 |
|   (1724, 9.13%) | (1712, 9.15%) | (1619, 9.26%) | (1619, 9.26%) | (1736, 9.15%) |
| 6      | 10.64±2.73 | 10.17±2.62 | 14.65±3.76 | 1.44±0.2  | 114.86±1.75 |
|   (1303, 6.90%) | (1292, 6.90%) | (1157, 6.62%) | (1157, 6.62%) | (1310, 6.90%) |
| 7      | 10.46±2.88 | 9.98±2.79  | 14.27±3.89 | 1.44±0.21 | 114.93±1.81 |
|   (932, 4.94%) | (928, 4.96%) | (841, 4.81%) | (841, 4.81%) | (939, 4.95%) |
TNB, total number born; NBA, number born alive; LBW, litter birth weight; ABW, average birth weight; GL, gestation length; AFS, age at first service; AFF, age at first farrowing.

1) The unit of traits are shown in parentheses.

2) Phenotypic data of different parities are displayed by mean±standard deviation;

3) The number of individuals and frequencies in different parities are shown in parentheses, respectively;

4) Different superscript letters (a, b, c, d, e) in the same column mean significant differences (P<0.05).

|   | 9.88±2.9 | 9.39±2.85 | 13.18±4 | 1.42±0.22 | 115.161.75 |
|---|----------|-----------|---------|-----------|------------|
| ≥8| (1370, 7.26%)^a | (1361, 7.27%)^d | (1187, 6.79%)^b | (1187, 6.79%)^d | (1380, 7.27%)^b |