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)[1)]	NBA (each)	LBW (kg)	ABW (kg)	GL (day)	AFS (day)	AFF (day)
1	10.31±2.96[2)]	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%)[a]	(8181, 43.72%)[3)]	(7669,43.86%)[a4)]	(7669, 43.86%)[a]	(8290, 43.67%)[a]	(1717, 39.36%)[a]	(1717,39.36%)[a]
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%) [b]	(1053, 56.28%)	(9815, 56.14%)[b]	(9815, 56.14%)[b]	(10692, 56.33%)[b]	(2645, 60.64%)[b]	(2645, 60.64%))[b]

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)] [a]	(1926, 11.02%)[ab4)]	(1926, 11.02%)[a]	(2119, 11.16%)[abc]	(791, 18.13%)[acd]	(791, 18.13%)[acd]
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%)[ab]	(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%)[abd]	(1609, 9.20%)[ac]	(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%)[c]	(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%)[d]	(1911, 10.07%)[abc]	(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%)[bc]	(496, 11.37%)[e]	(496, 11.37%)[e]

2014	10.68±2.43 (2472, 13.09%)[d]	10.3±2.3 (2447, 13.08%)[d]	14.26±3.35 (2374, 13.58%)[ad]	1.39±0.16 (2374, 13.58%)[f]	115.22±1.72 (2481, 13.07%)[a]	282.37±50.77 (707, 16.21%)[cd]	398.14±50.89 (707, 16.21%)[cd]
2015	11.20±2.73 (2136, 11.31%)[e]	10.58±2.53 (2125, 11.36%)[e]	14.59±3.4 (2072, 11.85%)[bc]	1.39±0.17 (2072, 11.85%)[f]	114.51±1.74 (2146, 11.31%)[e]	279.05±40.93 (341, 7.82%)[d]	394.01±41 (341, 7.82%)[d]
2016	10.94±2.59 (1648, 8.73%)[f]	10.35±2.4 (1634, 8.73%)[d]	15.43±3.63 (1391, 7.96%)[g]	1.47±0.22 (1391, 7.96%)[c]	114.361.68 (1656, 8.72%)[f]	260.9438.75 (352, 8.07%)[f]	375.55±38.89 (352, 8.07%)[f]

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).

Table S4. The effect of seasons on reproductive performance traits

Season	TNB (each)[1)]	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%)[a2)]	(4640, 24.80%)[3)]	(4371, 25.00%)[a4)]	(4371, 25.00%)[a]	(4692, 24.72%)	(1164, 26.69%)[a]	(1164, 26.69%)[a]
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%)[b]	(5208, 27.83%)	(4823, 27.59%)[ab]	(4823, 27.59%)[b]	(5269, 27.76%)	(1293, 29.64%)[b]	(1293, 29.64%)[b]
Autumn	10.42±2.83	10.03±2.74	14.21±3.94	1.42±0.21	115.14±1.81	280.72±50.03	396.15±50.1
	(4494, 23.80%)[ab]	(4444, 23.75%)	(4135, 23.65%)[b]	(4135, 23.65%)[c]	(4529, 23.86%)	(1028, 23.57%)[ab]	(1028, 23.57%,)[a]
Winter	10.51±2.99	10.1±2.85	14.32±4.02	1.43±0.21	115.081.85	291.42±53.64	407.12±53.65
	(4455, 23.59%)[a]	(4421, 23.63%)	(4155, 23.76%)[ab]	(4155, 23.76%)[a]	(4492, 23.66%)	(877, 20.11%)[c]	(877, 20.11%)[c]

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) [1)]	NBA(each)	LBW(kg)	ABW(kg)	GL(day)
1	9.96±2.67[2)]	9.63±2.6	13.06±3.74	1.36±0.2	115.45±1.88
	(4751, 25.16%)[a]	(4661, 24.91%)[3)a]	(4304, 24.62%)[a4)]	(4304, 24.62%)[a]	(4772, 25.14%)[a]
2	10.43±2.9	10.07±2.79	14.68±3.93	1.47±0.21	115.12±1.78
	(3602, 19.08%)[b]	(3580, 19.13%)[bc]	(3405, 19.47%)[b]	(3405, 19.47%)[b]	(3627, 19.11%)[b]
3	10.83±2.93	10.41±2.82	15.2±3.95	1.47±0.21	114.96±1.75
	(2909, 15.41%)[de]	(2897, 15.48%)[d]	(2783, 15.92%)[c]	(2783, 15.92%)[b]	(2917, 15.37%)[c]
4	11.01±3.03	10.5±2.86	15.23±4.02	1.46±0.21	114.87±1.72
	(2292, 12.14%)[e]	(2282, 12.19%)[d]	(2188, 12.51%)[c]	(2188, 12.51%)[b]	(2301, 12.12%)[c]
5	10.85±2.84	10.42±2.74	14.99±3.83	1.45±0.21	114.83±1.85
	(1724, 9.13%)[e]	(1712, 9.15%)[d]	(1619, 9.26%)[c]	(1619, 9.26%)[c]	(1736, 9.15%)[c]
6	10.64±2.73	10.17±2.62	14.65±3.76	1.44±0.2	114.86±1.75
	(1303, 6.90%)[cd]	(1292, 6.90%)[c]	(1157, 6.62%)[b]	(1157, 6.62%)[c]	(1310, 6.90%)[c]
7	10.46±2.88	9.98±2.79	14.27±3.89	1.44±0.21	114.93±1.81
	(932, 4.94%)[bc]	(928, 4.96%)[b]	(841, 4.81%)[d]	(841, 4.81%)[c]	(939, 4.95%)[c]

⩾8	9.88±2.9 (1370, 7.26%)[a]	9.39±2.85 (1361, 7.27%)[e]	13.18±4 (1187, 6.79%)[a]	1.42±0.22 (1187, 6.79%)[d]	115.161.75 (1380, 7.27%)[b]

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).