

Figure S1. No relationship between litter size and age of tester males. Each dot representing individual hybrids (n = 85).

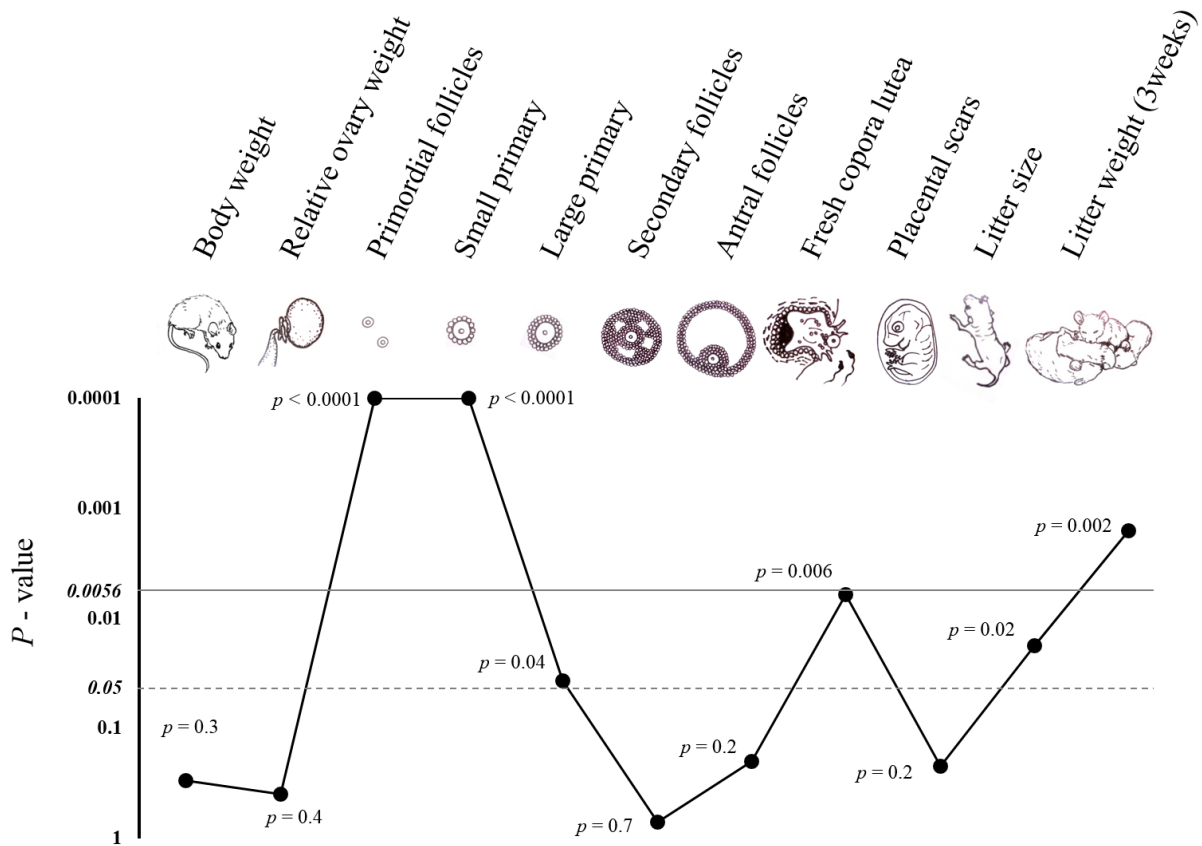


Figure S2. Hybrid female fertility along reproductive time scale. X-axis indicates reproductive traits in their developmental sequence, and the Y-axis shows p -values in log scale indicating the significant difference between combined controls and combined hybrids based on Wilcoxon rank sum test. $p = 0.05$ is indicated with a dashed line and Bonferroni correction ($\alpha=0.0056$) is indicated in solid line. For all reproductive parameters, low p -values are always associated with reduced fertility the same direction for reduced fertility in hybrids relative to controls.

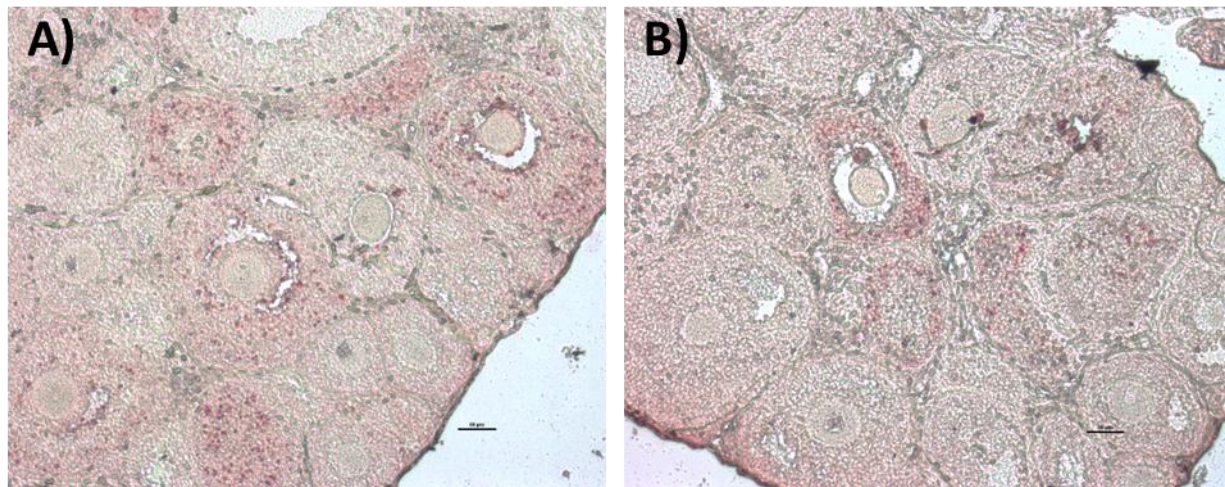


Figure S3. No significant differences between apoptotic cells between controls and hybrids.

Apoptotic cells for secondary follicles and antral follicles were counted using TUNEL assay at 21 day-old females. A) Ovary section of control genotype (*M. m. musculus*^{PWK} / *M. m. musculus*^{CZECH}). B) Ovary section of hybrid genotype (*M. m. musculus*^{PWK} / *M. m. domesticus*^{WSB}).

Table S1. Phenotype scores for each of the 106 mice at 63 day-old.

Genotype	ID	Body weight (g)	ROW (mg/g)	Litter size	Total litter weight (g)	Embryo survival (%)	Placental scars	Corpora lutea	Antral follicles	Secondary follicles	Large primary	Small primary	Primordial follicles
PWK x CZECH	TAS-H33	13.2	0.449	8	53.5	100.0	8	16	200	520	1200	5360	2920
PWK x CZECH	TAS-H34	12.9	0.451	7	57.1	100.0	7	25	440	800	2240	6120	3200
PWK x CZECH	TAS-H35	14.5	0.495	9	63.4	100.0	9	30	280	840	1440	5360	2400
PWK x CZECH	TAS-H91	12	0.425	7	51.5	100.0	7	12	160	200	720	3200	2800
PWK x CZECH	TAS-H92	12.2	0.456	5	31.8	55.6	9	16	120	480	960	3440	2720
PWK x CZECH	TAS-H93	12.6	0.390	8	58.5	100.0	8	12	200	400	1120	3560	2360
PWK x CZECH	TAS-H103	11.7	0.493	6	54.3	75.0	8	-	-	-	-	-	-
PWK x CZECH	TAS-H104	11.3	0.473	7	62.6	100.0	7	-	-	-	-	-	-
PWK x CZECH	TAS-H105	13.1	0.456	8	58.8	100.0	9	27	320	760	520	3760	3080
PWK x CZECH	TAS-H106	12.8	0.469	8	61.1	100.0	8	26	240	360	1120	3640	2280
PWK x CZECH	TAS-H107	12.8	0.445	8	68.7	88.9	9	23	120	800	920	4000	2440
LEWES x WSB	TAS-H42	13.5	0.329	6	67.6	85.7	7	25	200	560	1560	4920	4640
LEWES x WSB	TAS-H43	14.1	0.347	6	63.5	85.7	7	27	120	800	1720	6280	5240
LEWES x WSB	TAS-H44	14	0.325	7	77.6	100.0	7	24	240	600	1240	6640	1400
LEWES x WSB	TAS-H45	13.7	0.347	7	70.8	100.0	7	26	240	560	680	4760	2040
LEWES x WSB	TAS-H94	13.3	0.298	5	55.5	83.3	6	23	120	80	840	3000	3520
LEWES x WSB	TAS-H95	13.7	0.363	7	69.1	100.0	7	14	120	280	640	4240	4680
LEWES x WSB	TAS-H112	14.8	0.376	7	78.6	87.5	8	20	200	480	920	3320	3920
LEWES x WSB	TAS-H113	13.5	0.379	6	62.3	85.7	7	19	120	400	960	3200	4720
LEWES x WSB	TAS-H114	13.7	0.333	5	57.6	83.3	6	15	120	520	1000	3360	3960
LEWES x WSB	TAS-H46	13.9	0.412	0	n.a.	n.a.	0	22	240	480	1920	7520	3440
PWK x LEWES	TAS-H24	11.2	0.373	6	68.8	100.0	6	13	200	1040	840	4440	2840
PWK x LEWES	TAS-H25	11.6	0.455	6	52.5	100.0	6	19	280	840	1480	5480	3080
PWK x LEWES	TAS-H26	11.9	0.455	5	40.4	83.3	6	13	480	800	1560	5160	2960
PWK x LEWES	TAS-H31	13.2	0.346	7	62.9	100.0	7	-	-	-	-	-	-
PWK x LEWES	TAS-H32	15.5	0.316	6	54.8	100.0	6	-	-	-	-	-	-
PWK x LEWES	TAS-H67	13.9	0.384	8	64.5	100.0	8	13	80	80	600	3480	3480
PWK x LEWES	TAS-H68	13	0.368	6	43.2	100.0	6	19	160	560	960	4240	4480
PWK x LEWES	TAS-H79	12.7	0.358	6	49.7	100.0	6	12	160	160	920	3040	3600
PWK x LEWES	TAS-H99	15.1	0.331	6	26.1	75.0	8	14	160	360	760	1960	2160
PWK x LEWES	TAS-H100	13.5	0.329	7	53.1	100.0	7	20	360	280	760	2240	2640
PWK x LEWES	TAS-H66	13.3	0.198	0	n.a.	n.a.	0	0	240	280	600	1400	1880
LEWES x PWK	TAS-H21	12.2	0.186	7	51.8	100.0	7	13	160	480	920	2360	1960
LEWES x PWK	TAS-H22	12.8	0.260	5	57.8	83.3	6	15	280	680	1200	2080	3200
LEWES x PWK	TAS-H23	13.1	0.295	4	50.3	66.7	6	14	360	520	760	4680	3760
LEWES x PWK	TAS-H36	-	0.418	6	67.5	66.7	9	18	40	920	1440	3280	3440
LEWES x PWK	TAS-H38	-	0.303	3	30.7	50.0	6	11	240	480	1040	3960	1960
LEWES x PWK	TAS-H39	-	0.373	7	66.3	77.8	9	23	240	400	1440	3720	2400
LEWES x PWK	TAS-H85	13.7	0.289	7	62.1	77.8	9	15	120	200	1080	2600	1440
LEWES x PWK	TAS-H89	14.7	0.360	7	65.9	87.5	8	21	200	400	1520	3200	2280
LEWES x PWK	TAS-H90	15.3	0.354	6	55.4	100.0	6	20	240	480	920	2120	1440
LEWES x PWK	TAS-H37	-	0.236	0	n.a.	n.a.	0	6	80	400	1080	3200	2080
PWK x WSB	TAS-H57	14.2	0.480	6	43.1	85.7	7	22	120	400	920	3440	2000
PWK x WSB	TAS-H58	13.5	0.402	4	66.4	66.7	6	18	120	280	680	3080	3200
PWK x WSB	TAS-H59	11.7	0.418	5	48.1	100.0	5	18	200	520	880	2320	2440
PWK x WSB	TAS-H60	12	0.41554	3	30.9	60.0	5	14	160	360	640	3720	2160
PWK x WSB	TAS-H62	11	0.395	5	41.2	83.3	6	9	280	480	920	3120	3160
PWK x WSB	TAS-H63	12.3	0.072	3	28.6	50.0	6	11	80	320	560	2520	2360
PWK x WSB	TAS-H109	12.3	0.362	6	-	100.0	6	12	80	560	600	2560	1960
PWK x WSB	TAS-H110	11.5	0.354	5	43.9	83.3	6	17	160	360	560	3240	2880
PWK x WSB	TAS-H111	11.9	0.468	5	45.4	71.4	7	16	80	640	600	2880	1680
PWK x WSB	TAS-H61	10.4	0.395	0	n.a.	0.0	5	6	40	200	640	2280	1360

" - " data missing.

"n.a.", not apply.

Table S1. Phenotype scores for each of the 106 mice at 63 day-old. (continued)

Genotype	ID	Body weight (g)	ROW (mg/g)	Litter size	Total litter weight (g)	Embryo survival (%)	Placental scars	Corpora lutea	Antral follicles	Secondary follicles	Large primary	Small primary	Primordial follicles
WSB x PWK	TAS-H40	12.9	0.380	5	51	62.5	8	17	240	440	1360	4280	1920
WSB x PWK	TAS-H41	13.4	0.363	5	54.3	71.4	7	26	280	560	840	4320	1600
WSB x PWK	TAS-H72	15.9	0.387	7	66.1	77.8	9	17	240	480	1040	4240	4000
WSB x PWK	TAS-H74	12.2	0.388	6	55.8	66.7	9	25	320	400	840	3560	3480
WSB x PWK	TAS-H86	16.7	0.357	10	106.8	100.0	10	22	240	720	1120	4480	3240
WSB x PWK	TAS-H87	14.1	0.377	7	55.1	63.6	11	16	200	520	840	3120	1680
WSB x PWK	TAS-H88	16.6	0.352	6	64.7	85.7	7	15	240	160	920	3120	2800
WSB x PWK	TAS-H101	14.7	0.409	6	46.4	85.7	7	23	280	400	640	2400	1960
WSB x PWK	TAS-H102	16	0.420	5	42.4	50.0	10	19	160	400	880	3000	2240
WSB x PWK	TAS-H73	14.2	0.282	0	n.a.	n.a.	0	10	360	680	1000	2440	2200
CZECH x LEWES	TAS-H97	12.7	0.380	6	62	100.0	6	26	120	480	920	2480	1160
CZECH x LEWES	TAS-H98	12.8	0.371	6	45.4	100.0	6	19	440	360	1000	2960	1080
CZECH x LEWES	TAS-H118	13.5	0.407	7	60.6	100.0	7	15	280	640	880	2560	2240
CZECH x LEWES	TAS-H119	13.1	0.468	8	79	100.0	8	16	240	640	1400	3440	1800
CZECH x LEWES	TAS-H121	12	0.432	7	58.1	100.0	7	18	200	720	1160	1360	800
CZECH x LEWES	TAS-H138	14	0.589	10	86.6	100.0	10	22	280	520	1040	3520	1160
CZECH x LEWES	TAS-H139	12.8	0.550	8	85.6	88.9	9	24	520	760	1360	3840	1760
CZECH x LEWES	TAS-H96	11.9	0.272	0	n.a.	n.a.	0	7	320	840	960	2440	880
CZECH x LEWES	TAS-H120	12.1	0.196	0	n.a.	n.a.	0	7	120	280	480	2480	2120
CZECH x LEWES	TAS-H122	12.7	0.242	0	n.a.	n.a.	0	7	80	280	480	1920	680
CZECH x LEWES	TAS-H123	12.8	0.375	0	n.a.	n.a.	0	9	80	680	1120	1960	480
CZECH x LEWES	TAS-H124	14	0.202	0	n.a.	n.a.	0	0	200	280	720	800	560
LEWES x CZECH	TAS-H47	-	0.408	6	51.3	85.7	7	14	200	440	960	3160	1640
LEWES x CZECH	TAS-H49	-	0.411	6	62.7	85.7	7	22	200	720	1560	4120	2760
LEWES x CZECH	TAS-H50	-	0.366	3	27.2	100.0	3	13	360	800	920	2560	1800
LEWES x CZECH	TAS-H51	-	0.453	5	66.9	71.4	7	16	280	520	1200	3400	1360
LEWES x CZECH	TAS-H54	12.7	0.398	7	78.7	100.0	7	21	280	920	560	2920	1720
LEWES x CZECH	TAS-H55	13.4	0.485	8	72.5	100.0	8	23	240	800	1200	3360	2200
LEWES x CZECH	TAS-H56	12.3	0.507	7	61.4	100.0	7	16	160	600	1120	2800	1280
LEWES x CZECH	TAS-H64	13.1	0.442	8	-	88.9	9	21	580	720	1160	5200	4000
LEWES x CZECH	TAS-H65	12.2	0.397	6	-	60.0	10	-	340	240	600	2480	2440
LEWES x CZECH	TAS-H48	-	0.417	0	n.a.	0.0	1	9	120	720	1840	4560	1640
CZECH x WSB	TAS-H132	13.5	0.397	7	63.2	77.8	9	17	200	320	600	2560	800
CZECH x WSB	TAS-H134	12.4	0.422	7	66.2	100.0	7	16	280	360	720	3040	1920
CZECH x WSB	TAS-H135	11.9	0.429	5	62.6	83.3	6	12	440	360	640	2160	1120
CZECH x WSB	TAS-H136	11.3	0.399	7	67.3	87.5	8	16	360	440	640	2880	1880
CZECH x WSB	TAS-H137	16.3	0.424	6	50.5	85.7	7	24	200	480	920	2320	2240
CZECH x WSB	TAS-H143	11.7	0.408	5	49.1	62.5	8	-	-	-	-	-	-
CZECH x WSB	TAS-H168	-	0.518	7	-	100.0	7	26	240	440	720	2680	1000
CZECH x WSB	TAS-H133	10.8	0.322	0	n.a.	0.0	6	6	40	160	440	1440	1800
CZECH x WSB	TAS-H144	11	0.299	0	n.a.	0.0	8	-	-	-	-	-	-
WSB x CZECH	TAS-H52	11.8	0.472	5	74.9	71.4	7	19	200	600	680	2880	1880
WSB x CZECH	TAS-H53	11.8	0.465	7	53.7	100.0	7	24	320	640	680	4360	1880
WSB x CZECH	TAS-H69	13.6	0.401	8	48.8	80.0	10	13	360	560	680	2480	2920
WSB x CZECH	TAS-H70	15	0.434	6	74.8	66.7	9	17	280	400	880	3520	3280
WSB x CZECH	TAS-H71	12.5	0.491	7	69.9	100.0	7	16	360	480	760	3800	2840
WSB x CZECH	TAS-H80	13.2	0.460	8	84.7	100.0	8	26	240	560	960	4080	3240
WSB x CZECH	TAS-H81	12.8	0.465	5	66.4	71.4	7	24	400	800	1200	3600	2560
WSB x CZECH	TAS-H82	12.4	0.468	8	88.4	80.0	10	33	120	680	960	3440	2080
WSB x CZECH	TAS-H83	14.2	0.485	8	82.7	72.7	11	33	400	800	680	2120	1320
WSB x CZECH	TAS-H84	11.7	0.473	3	32.7	37.5	8	20	400	840	600	2240	1120
WSB x CZECH	TAS-H115	13.3	0.374	7	68.8	100.0	7	19	120	360	1120	2280	1040
WSB x CZECH	TAS-H116	16.2	0.495	7	78.1	63.6	11	-	-	-	-	-	-
WSB x CZECH	TAS-H117	12.8	0.355	4	30.9	66.7	6	17	200	560	520	2400	1280

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"n.a.", not apply.

Table S2. Phenotype scores for each of the 22 mice at 120 day-old.

Genotype	ID	Body weight (g)	ROW (mg/g)	Litter size	Total litter weight (g)	Embryo survival (%)	Placental scars	Corpora lutea	Antral follicles	Secondary follicles	Large primary	Small primary	Primordial follicles
PWK x LEWES	TAS-H141	16.8	0.331	7	60.8	100.0	7	14	80	280	840	1680	1200
PWK x LEWES	TAS-H142	15.7	0.415	8	84.9	80.0	10	21	160	440	800	2240	1960
PWK x LEWES	TAS-H150	17.9	0.378	5	48.1	83.3	6	14	80	480	1560	2560	1160
PWK x LEWES	TAS-H151	15.7	0.308	7	56.1	100.0	7	15	40	400	960	2000	1000
PWK x LEWES	TAS-H175	13.6	0.332	7	36.7	100.0	7	13	40	200	480	1520	1000
PWK x LEWES	TAS-H176	14.1	0.348	8	71.9	88.9	9	16	200	200	360	1120	840
PWK x LEWES	TAS-H177	14.1	0.359	5	64.2	83.3	6	23	160	360	600	1640	1080
PWK x LEWES	TAS-H179	13.6	0.402	6	59.9	75.0	8	17	280	240	600	1840	1080
PWK x LEWES	TAS-H178	14.4	0.123	0	n.a.	n.a.	0	5	120	320	520	1720	1520
PWK x LEWES	TAS-H140	13.9	0.201	0	n.a.	n.a.	0	5	280	400	560	1440	1160
PWK x LEWES	TAS-H180	13.2	0.159	0	n.a.	n.a.	0	6	160	400	920	1560	1920
LEWES x PWK	TAS-H130	16.3	0.329	7	66.8	100.0	7	20	40	360	840	2480	1720
LEWES x PWK	TAS-H153	15.7	0.344	6	56.7	85.7	7	18	120	200	560	2240	1520
LEWES x PWK	TAS-H154	18	0.394	9	80.3	90.0	10	21	40	440	760	2320	1960
LEWES x PWK	TAS-H158	-	0.379	8	-	88.9	9	16	160	120	800	1440	1360
LEWES x PWK	TAS-H159	-	0.379	9	-	90.0	10	17	200	360	520	1640	1240
LEWES x PWK	TAS-H181	15.8	0.343	9	73.2	100.0	9	18	80	320	960	1360	1160
LEWES x PWK	TAS-H182	16.2	0.388	9	-	100.0	9	21	240	520	920	1600	1360
LEWES x PWK	TAS-H131	16.1	0.210	0	n.a.	n.a.	0	0	120	440	720	2240	1720
LEWES x PWK	TAS-H152	14.8	0.153	0	n.a.	0.0	1	1	320	320	1320	2400	1760
LEWES x PWK	TAS-H157	-	0.191	0	n.a.	n.a.	0	8	360	240	1000	2440	1440
LEWES x PWK	TAS-H183	17.1	0.232	0	n.a.	n.a.	0	7	40	520	1160	2080	2200

" - " data missing.

"n.a.", not apply.

Table S3. Classification of follicles used in the study.

Groups	Classes¹	Descriptions¹
Smaller follicles ²	Primordial follicles	A small oocyte surrounded by a layer of few or no fusiform-shaped granulosa cells.
	Small primary follicles	A single complete ring of granulosa cells (no more than 15 cells) surrounding a small oocyte.
	Large primary follicles ⁴	A single complete ring of granulosa cells (more than 15 cells) surrounding a growing oocyte.
Larger follicles ³	Secondary follicles	Multiple layers of granulosa cells surrounding an oocyte but had no major cavity containing follicle fluid.
	Antral follicles	Multiple layers of granulosa cells surrounding an oocyte with a single or multiple major cavities.

¹Classes and their descriptions are based on personal communications with P. Hoyer.

²Total number of primordial follicles and small primary follicles.

³Total number of secondary follicles and antral follicles.

⁴Transitional follicles between “small primary” to “large primary” and between “large primary” and “secondary” were scored as large primary follicles when the state was ambiguous in several cases.

Table S4. Test for delayed puberty using two hybrid genotypes.

Female hybrid age	Successful pregnancies ¹ %	Body weight g (SE)	ROW ² mg/g (SE)	Smaller follicles x10 ² (SE)	Larger follicles x10 ² (SE)	Corpora lutea (SE)	Placental scars (SE)	Embryo survival ³ % (SE)	Litter size (SE)	Individual pup weight g (SE)	Total litter weight g (SE)
<i>M. m. musculus</i> ^{PWK} x <i>M. m. domesticus</i> ^{LEWES}											
63 day-old	91 (10/11)	13.2 (0.4)	0.35 (0.02)	65.1 (6.6)	7.2 (1.3)	13.7 (2.0)	6.0 (0.6)	95.8 (2.8)	5.7 (0.6)	8.9 (0.1)	49.9 (3.3)
120 day-old	73 (8/11)	14.8 (0.5)↑	0.31 (0.03)	30.2 (1.9)↓*	4.8 (0.4)	13.5 (1.8)	5.5 (1.1)	88.8 (3.5)	4.8 (1.0)	9.2 (0.1)	60.3 (5.1)
<i>p</i> value		<i>p</i> = 0.009		<i>p</i> = 0.0006							
<i>M. m. domesticus</i> ^{LEWES} x <i>M. m. musculus</i> ^{PWK}											
63 day-old	90 (9/10)	13.6 (0.5)	0.33 (0.02)	55.2 (4.5)	6.9 (0.6)	15.6 (1.6)	6.6 (0.8)	78.9 (5.4)	5.2 (0.7)	9.4 (0.1)	56.4 (3.8)
120 day-old	64 (7/11)	16.3 (0.3)↑*	0.30 (0.03)	36.1 (2.0)↓*	5.1 (0.4)↓	13.4 (2.4)	5.6 (1.4)	92.0 (3.4)	5.2 (1.3)	8.9 (0.2)↓	69.3 (5.0)
<i>p</i> value		<i>p</i> = 0.004		<i>p</i> = 0.002	<i>p</i> = 0.03					<i>p</i> = 0.03	

¹ Successful pregnancies: number of females that reproduced / total number of females

² Relative ovary weight: milligrams of ovary / gram of body weight

³ Embryo survival: litter size at birth / placental scars

↑ or ↓ indicate significantly larger or smaller versus the 63 day-old genotype based on Wilcoxon rank sum test based on raw p-values (*p* < 0.05).

* indicates comparisons that remained significant after Bonferroni correction $\alpha = 0.0045$. SE, Standard Error.

Table S5. Comparisons of reproductive parameters between hybrid female progeny of reciprocal crosses (n=106).

F1 genotype (female x male)	Successful pregnancies ¹ %	Body weight g (SE)	ROW ² mg/g (SE)	Smaller follicles x10 ² (SE)	Larger follicles x10 ² (SE)	Corpora lutea (SE)	Placental scars (SE)	Embryo survival ³ % (SE)	Litter size (SE)	Individual pup weight g (SE)	Total litter weight (SE)	g
<i>M. m. musculus</i> ^{PWK} x <i>M. m. domesticus</i> ^{LEWES}	91 (10/11)	13.2 (0.4)	0.35 (0.02)	65.1 (6.6)	7.2 (1.3)	13.7 (2.0)	6.0 (0.6)	95.8 (2.8)↑	5.7 (0.6)	8.9 (0.1)↓	49.9 (3.3)	
<i>M. m. domesticus</i> ^{LEWES} x <i>M. m. musculus</i> ^{PWK}	90 (9/10)	13.6 (0.5)	0.33 (0.02)	55.2 (4.5)	6.9 (0.6)	15.6 (1.6)	6.6 (0.8)	78.9 (5.4)↓	5.2 (0.7)	9.4 (0.1)↑	56.4 (3.8)	
<i>p</i> value								<i>p</i> = 0.02		<i>p</i> = 0.006		
<i>M. m. musculus</i> ^{PWK} x <i>M. m. domesticus</i> ^{WSB}	90 (9/10)	12.1 (0.4)↓*	0.41 (0.02)	52.4 (2.8)	5.4 (0.5)	14.3 (1.5)	5.9 (0.2)↓	70.0 (9.3)	4.2 (0.6)↓	9.7 (0.2)	43.5 (4.1)↓	
<i>M. m. domesticus</i> ^{WSB} x <i>M. m. musculus</i> ^{PWK}	90 (9/10)	14.7 (0.5)↑*	0.37 (0.01)	60.1 (4.2)	7.3 (0.6)	19.0 (1.6)	7.8 (1.0)↑	73.7 (5.1)	5.7 (0.8)↑	9.9 (0.1)	60.3 (6.3)↑	
<i>p</i> value		<i>p</i> = 0.003					<i>p</i> = 0.005		<i>p</i> = 0.05		<i>p</i> = 0.03	
<i>M. m. musculus</i> ^{CZECH} x <i>M. m. domesticus</i> ^{LEWES}	58 (7/12)	12.9 (0.2)	0.37 (0.04)	37.1 (3.9)↓	7.8 (0.8)	14.2 (2.3)	4.4 (1.2)	98.4 (1.6)↑	4.3 (1.1)	9.4 (0.1)	53.7 (8.3)	
<i>M. m. domesticus</i> ^{LEWES} x <i>M. m. musculus</i> ^{CZECH}	90 (9/10)	12.7 (0.2)	0.43 (0.02)	56.1 (5.4)↑	9.3 (0.6)	17.2 (1.6)	6.6 (0.8)	79.2 (9.8)↓	5.6 (0.8)	9.3 (0.1)	60.1 (6.4)	
<i>p</i> value				<i>p</i> = 0.02				<i>p</i> = 0.0489				
<i>M. m. musculus</i> ^{CZECH} x <i>M. m. domesticus</i> ^{WSB}	78 (7/9)	12.4 (0.6)	0.40 (0.02)	39.8 (2.9)	6.2 (0.8)↓	16.7 (2.6)	7.3 (0.3)	66.3 (13.1)	4.9 (1.0)	9.8 (0.1)↓*	59.8 (3.3)	
<i>M. m. domesticus</i> ^{WSB} x <i>M. m. musculus</i> ^{CZECH}	100 (13/13)	13.2 (0.4)	0.45 (0.01)	52.2 (4.2)	8.9 (0.7)↑	21.8 (1.9)	8.3 (0.5)	77.7 (5.2)	6.4 (0.5)	10.6 (0.1)↑*	65.8 (5.2)	
<i>p</i> value					<i>p</i> = 0.02					<i>p</i> < 0.0001		

¹ Successful pregnancies: number of females that reproduced / total number of females

² Relative ovary weight: milligrams of ovary / gram of body weight

³ Embryo survival: litter size / placental scars

↑ or ↓ indicate significantly larger or smaller versus the reciprocal genotype based on Wilcoxon rank sum test based on raw p-values (*p* < 0.05).

* indicates comparisons that remained significant after Bonferroni correction $\alpha = 0.0045$. SE, Standard Error.

Table S6. Test for paternal polymorphism within subspecies for reproductive parameters (n=106).

Cross x male)	(female)	Successful pregnancies ¹ %	Body weight g (SE)	ROW ² mg/g (SE)	Smaller follicles x10 ² (SE)	Larger follicles x10 ² (SE)	Corpora lutea (SE)	Placental scars (SE)	Embryo survival ³ %	Litter size (SE)	Individual pup weight (SE)	Total litter weight g (SE)
<i>M. m. domesticus</i> polymorphism												
<i>M. m. musculus</i> ^{PWK} x <i>M. m. domesticus</i> ^{LEWES}		91 (10/11)	13.2 (0.4)	0.35 (0.02)↓	65.1 (6.6)	7.2 (1.3)	13.7 (2.0)	6.0 (0.6)	95.8 (2.8)↑	5.7 (0.6)↑	8.9 (0.1)↓*	49.9 (3.3)
<i>M. m. musculus</i> ^{PWK} x <i>M. m. domesticus</i> ^{WSB}		90 (9/10)	12.1 (0.4)	0.41 (0.02)↑	52.4 (2.8)	5.4 (0.5)	14.3 (1.5)	5.9 (0.2)	70.0 (9.3)↓	4.2 (0.6)↓	9.7 (0.2)↑*	43.5 (4.1)
<i>p</i> value				<i>p</i> = 0.045				<i>p</i> = 0.009		<i>p</i> = 0.01		<i>p</i> = 0.002
<i>M. m. musculus</i> ^{CZECH} x <i>M. m. domesticus</i> ^{LEWES}		58 (7/12)	12.9 (0.2)	0.37 (0.04)	37.1 (3.9)	7.8 (0.8)	14.2 (2.3)	4.4 (1.2)	98.4 (1.6)↑	4.3 (1.1)	9.4 (0.1)	53.7 (8.3)
<i>M. m. musculus</i> ^{CZECH} x <i>M. m. domesticus</i> ^{WSB}		78 (7/9)	12.4 (0.6)	0.40 (0.02)	39.8 (2.9)	6.2 (0.8)	16.7 (2.6)	7.3 (0.3)	66.3 (13.1)↓	4.9 (1.0)	9.8 (0.1)	59.8 (3.3)
<i>p</i> value									<i>p</i> = 0.009			
<i>M. m. musculus</i> polymorphism												
<i>M. m. domesticus</i> ^{LEWES} x <i>M. m. musculus</i> ^{PWK}		90 (9/10)	13.6 (0.5)	0.33 (0.02)↓	55.2 (4.5)	6.9 (0.6)↓	15.6 (1.6)	6.6 (0.8)	78.9 (5.4)	5.2 (0.7)	9.4 (0.1)	56.4 (3.8)
<i>M. m. domesticus</i> ^{LEWES} x <i>M. m. musculus</i> ^{CZECH}		90 (9/10)	12.7 (0.2)	0.43 (0.02)↑	56.1 (5.4)	9.3 (0.6)↑	17.2 (1.6)	6.6 (0.8)	79.2 (9.8)	5.6 (0.8)	9.3 (0.1)	60.1 (6.4)
<i>p</i> value				<i>p</i> = 0.007		<i>p</i> = 0.02						
<i>M. m. domesticus</i> ^{WSB} x <i>M. m. musculus</i> ^{PWK}		90 (9/10)	14.7 (0.5)↑	0.37 (0.01)↓*	60.1 (4.2)	7.3 (0.6)	19.0 (1.6)	7.8 (1.0)	73.7 (5.1)	5.7 (0.8)	9.9 (0.1)↓*	60.3 (6.3)
<i>M. m. domesticus</i> ^{WSB} x <i>M. m. musculus</i> ^{CZECH}		100 (13/13)	13.2 (0.4)↓	0.45 (0.01)↑*	52.2 (4.2)	8.9 (0.7)	21.8 (1.9)	8.3 (0.5)	77.7 (5.2)	6.4 (0.5)	10.6 (0.1)↑*	65.8 (5.2)
<i>p</i> value			<i>p</i> = 0.03		<i>p</i> = 0.004		<i>p</i> = 0.001					

¹ Successful pregnancies: number of females that reproduced / total number of females² Relative ovary weight: milligrams of ovary / gram of body weight³ Embryo survival: litter size/placental scars↑ or ↓ indicate significantly larger or smaller versus the hybrid genotypes that differ in paternal strain based on Wilcoxon rank sum test based on raw *p*-values (*p* < 0.05).* indicates comparisons that remained significant after Bonferroni correction $\alpha = 0.0045$. SE, Standard Error.

Table S7. Test for maternal polymorphisms within subspecies for reproductive parameters (n=106).

Cross	(female x male)	Successful pregnancies ¹ %	Body weight g (SE)	ROW ² mg/g (SE)	Smaller follicles x10 ² (SE)	Larger follicles x10 ² (SE)	Corpora lutea (SE)	Placental scars (SE)	Embryo survival ³ % (SE)	Litter size (SE)	Individual pup weight (SE)	Total litter weight g (SE)
<i>M. m. domesticus</i> polymorphism												
<i>M. m. domesticus</i> ^{LEWES}	x	90 (9/10)	13.6 (0.5)	0.33 (0.02)	55.2 (4.5)	6.9 (0.6)	15.6 (1.6)	6.6 (0.8)	78.9 (5.4)	5.2 (0.7)	9.4 (0.1)↓	56.4 (3.8)
<i>M. m. musculus</i> ^{PWK}												
<i>M. m. domesticus</i> ^{WSB}	x <i>M.</i>	90 (9/10)	14.7 (0.5)	0.37 (0.01)	60.1 (4.2)	7.3 (0.6)	19.0 (1.6)	7.8 (1.0)	73.7 (5.1)	5.7 (0.8)	9.9 (0.1)↑	60.3 (6.3)
<i>m. musculus</i> ^{PWK}												
<i>p</i> value											<i>p</i> = 0.01	
<i>M. m. domesticus</i> ^{LEWES}	x	90 (9/10)	12.7 (0.2)	0.43 (0.02)	56.1 (5.4)	9.3 (0.6)	17.2 (1.6)	6.6 (0.8)	79.2 (9.8)	5.6 (0.8)	9.3 (0.1)↓*	60.1 (6.4)
<i>M. m. musculus</i> ^{CZECH}												
<i>M. m. domesticus</i> ^{WSB}	x	100 (13/13)	13.2 (0.4)	0.45 (0.01)	52.2 (4.2)	8.9 (0.7)	21.8 (1.9)	8.3 (0.5)	77.7 (5.2)	6.4 (0.5)	10.6 (0.1)↑*	65.8 (5.2)
<i>M. m. musculus</i> ^{CZECH}												
<i>p</i> value											<i>p</i> < 0.0001	
<i>M. m. musculus</i> polymorphism												
<i>M. m. musculus</i> ^{PWK}	x <i>M.</i>	91 (10/11)	13.2 (0.4)	0.35 (0.02)	65.1 (6.6)↑	7.2 (1.3)	13.7 (2.0)	6.0 (0.6)	95.8 (2.8)	5.7 (0.6)	8.9 (0.1)↓	49.9 (3.3)
<i>m. domesticus</i> ^{LEWES}												
<i>M. m. musculus</i> ^{CZECH}	x <i>M.</i>	58 (7/12)	12.9 (0.2)	0.37 (0.04)	37.1 (3.9)↓	7.8 (0.8)	14.2 (2.3)	4.4 (1.2)	98.4 (1.6)	4.3 (1.1)	9.4 (0.1)↑	53.7 (8.3)
<i>m. domesticus</i> ^{LEWES}												
<i>p</i> value					<i>p</i> = 0.006	<i>p</i> = 0.03						
<i>M. m. musculus</i> ^{PWK}	x <i>M.</i>	90 (9/10)	12.1 (0.4)	0.41 (0.02)	52.4 (2.8)↑	5.4 (0.5)	14.3 (1.5)	5.9 (0.2)↓	70.0 (9.3)	4.2 (0.6)	9.7 (0.2)	43.5 (4.1)
<i>m. domesticus</i> ^{WSB}												
<i>M. m. musculus</i> ^{CZECH}	x <i>M.</i>	78 (7/9)	12.4 (0.6)	0.40 (0.02)	39.8 (2.9)↓	6.2 (0.8)	16.7 (2.6)	7.3 (0.3)↑	66.3 (13.1)	4.9 (1.0)	9.8 (0.1)	59.8 (3.3)
<i>m. domesticus</i> ^{WSB}												
<i>p</i> value					<i>p</i> = 0.03	<i>p</i> = 0.006						

¹ Successful pregnancies: number of females that reproduced / total number of females

² Relative ovary weight: milligrams of ovary / gram of body weight

³ Embryo survival: litter size / placental scars

↑ or ↓ indicate significantly larger or smaller versus the hybrid genotypes that differ in maternal strain based on Wilcoxon rank sum test based on raw p-values (*p* < 0.05).

* indicates comparisons that remained significant after Bonferroni correction $\alpha = 0.0045$. SE, Standard Error.

Table S8. Summary of F1 hybrid sterility between males and females.

Parameters	Male hybrids*	Female hybrids
Body weight ¹	15% Increased	4% Reduced
Reproductive organ ²	39% Reduced	2% Reduced
Number of germ cells ³	74% Reduced	22% Reduced
Polymorphism	<i>M. m. musculus</i>	<i>M. m. musculus</i> <i>M. m. domesticus</i>
Effects on reproductive incompatibilities	Greater in <i>M. m. musculus</i> ^{CZECH} relative to <i>M. m. musculus</i> ^{PWK}	Greater in <i>M. m. domesticus</i> ^{WSB} relative to <i>M. m. musculus</i> ^{LEWES}

% is based on the average increase or decrease of combined intra-subspecific control versus combined inter-subspecific hybrids

¹ Measured at 60 day-old in males and 63 day-old in females.

² Relative testis weight (testis weight / body weight) in males and relative ovary weight (ovary weight / body weight) in females.

³ Number of sperm in males and number of corpora lutea in females.

*Data for male hybrid sterility is based on Good et al. (2008a)