High investment into reproduction is associated with reduced lifespan in dogs.

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Supplementary Material

Table S1. Lifespan sources.

Lifespan		
Source	breeds (n =)	cor
https://www.akc.org	270	r > 0.6
Michell,1999	66	
Bell et al. 2012	176	
O´Neill et al. 2013	35	
Leroy et al. 2015	7	
Total (different breeds)	277	

Table S2. Adult weight sources.

Adult Weight		
Source	breeds (n =)	cor
https://www.akc.org	253	r > 0.94
Speakman et al. 2003	3	
Hawthorne et al. 2004	12	
Gerstner et al. 2010	31	
Bell et al. 2012	177	
Kraus et al. 2013	74	
Fan et al. 2016	89	
Total (different breeds)	281	

Table S3. Neonate weight sources

Neonate Weight		
Source	breeds (n =)	cor
Compendia	39	r = 0.84
Clark et al. 2017a		
Clark et al. 2017b		
Clark et al. 2017c		
Scientific Articles	188	
Yilmaz, 2007		
Groppetti et al. 2015		
Fan et al. 2016		
Groppetti et al. 2017		
Total (different breeds)	152	

Table S4. Litter size sources.

Litter size			
Source	breeds (n =)		cor
Compendia		39	r = 0.83
Bell et al. 2012	1		
Clark et al. 2017a	38		
Clark et al. 2017b			
Clark et al. 2017c			
Scientific Articles		383	
Wildt et al. 1982	1		
Okkens et al. 1993	5		
Nielen et al. 2001	5		
Thomassen et al. 2006	6		
Yilmaz, 2007	1		
Ograk, 2009	1		
Gubbels et al. 2009	12		
Borge et al. 2011	199		
Groppetti et al. 2015	30		
Leroy et al. 2015	7		
Mila et al. 2015	14		
Goleman et al. 2015	8		
Schrack et al. 2017	1		
Groppetti et al. 2017	93		
Websites		13	
https://www.dogbreedinfo.com	13		
http://www.easypetmd.com	13		
Total (different breeds)	253		

Table S5. Bayesian mixed model of the relationship between lifespan (dependent variable) and adult weight (square root transformed) among dog breeds. Adult weight is a fixed effect. Estimates of shared ancestry (based on shared SNPs) and recent gene flow (based on haplotype sharing) were included as random effects. Shown are: the effective sample sizes (eff.samp) for all parameters, their posterior means (post.mean), the 95% credibility intervals (95% CrI), the proportion of the variance partitioned among the random effects and the residual variance (% variance explained), and for the fixed effect an estimate of the p value (pMCMC).

Random effects	**eff.samp**	***post. mean***	***95% CrI***	**% variance explained**
Shared ancestry	6062	0.87	0.12, 1.87	73.11
Gene flow	5568	0.3	0.15, 0.45	25.21
Residual variance	2492	0.02	0.0001, 0.09	1.68
Fixed effects				**pMCMC**
Intercept	6600	-0.54	-2.42, 1.03	0.53
weight	6600	-0.72	-0.87, -0.56	<2e-04 ***

Table S6. Bayesian mixed model of the relationship between lifespan (dependent variable) and adult reproductive investment (Rep invest.), among dog breeds. Reproductive investment is a fixed effect. Estimates of shared ancestry (based on shared SNPs) and recent gene flow (based on haplotype sharing) were included as random effects. Shown are: the effective sample sizes (eff.samp) for all parameters, their posterior means (post.mean), the 95% credibility intervals (95% CrI), the proportion of the variance partitioned among the random effects and the residual variance (% variance explained), and for the fixed effect an estimate of the p value (pMCMC).

Random effects	**eff.samp**	***post. mean***	***95% CrI***	**% variance explained**
Shared ancestry	4551	0.882	0.11, 1.9	73.13
Gene flow	4522	0.302	0.14, 0.45	25.04
Residual variance	1784	0.022	0.0002, 0.09	1.82
Fixed effects				**pMCMC**
Intercept	5000	-0.54	-2.27, 1.14	0.52
Rep invest	5240	-0.71	-0.87, -0.57	**<2e-04 *****

Table S7. Bayesian mixed model of the relationship between growth rate (growth rate proxy, square root transformed), Reproductive investment (Rep invest.), and lifespan among dog breeds. Growth rate and reproductive investment are fixed effects and their interactive effect on lifespan was also tested. Estimates of shared ancestry (based on shared SNPs) and recent gene flow (based on haplotype sharing) were included as random effects. Shown are, the effective sample sizes (eff.samp) for all parameters, their posterior means (post.mean), the 95% credibility intervals (95% CrI), the proportion of the variance partitioned among the random effects and the residual variance (% variance explained), and for the fixed effect an estimate of the p value (pMCMC). Information on onset of puberty necessary to calculate the growth rate proxy is from Johnston et al. (2002).

Random effects	**eff.samp**	***post. mean***	***95% CrI***	**% variance explained**
Shared ancestry	6395	0.83	0.08, 2.10	70.34
Gene flow	7620	0.31	0.10, 0.56	26.27
Residual variance	1977	0.04	0.0001, 0.18	3.39
Fixed effects				**pMCMC**
Intercept	6600	0.04	-1.64, 1.87	0.9
Growth rate	6600	-0.44	-0.78, -0.09	0.01**
Rep invest	7012	-0.5	-0.85, -0.14	0.006**
Growth rate:Rep invest	6600	-0.37	-0.64, -0.09	0.008**

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