Table S1. Preliminary analyses for effects of treating female red squirrels with different dosages of glucocorticoids (GCs) during (A) pregnancy or (B) lactation on offspring postnatal growth. Offspring growth is the linear change in body mass from ~1 d to ~25 d of age. The dosages of GCs are listed below with 0 mg (pregnancy control treatment, n = 52 pups; lactation control treatment, n = 36 pups) as the reference value. Models contained random intercept term for litter identity (pregnancy model: $\sigma^2 = 0.059$; lactation model: $\sigma^2 = 0.23$). Note that these results were used to justify our decision of lumping the different pregnancy GCs treatment groups (with different dosages of GCs) together.

(A)

Treatment Period	Variable	b	SE	t	df	P-value
Pregnancy	**Intercept (2012, Female, 0 mg)**	**1.56**	**0.17**	**9.3**	**32.0**	**<0.0001**
	Year (2015)	0.06	0.21	0.31	32.2	0.76
	Year (2016)	-0.26	0.18	-1.41	31.7	0.17
	Year (2017)	**-0.41**	**0.18**	**-2.28**	**31.6**	**0.03**
	Sex (Male)	0.037	0.02	1.45	74.5	0.15
	Birth date	-0.001	0.05	-0.01	32.8	0.99
	Litter size	0.035	0.05	0.72	34.2	0.48
	Treatment (GC dosage)					
	3 mg GCs (n = 9 pups)	0.37	0.24	1.52	30.9	0.14
	6 mg GCs (n = 7 pups)	**0.68**	**0.20**	**3.45**	**32.4**	**0.001**
	8 mg GCs (n = 45 pups)	0.12	0.09	1.40	33.1	0.17
	12 mg GCs (n = 1 pup)	**0.91**	**0.31**	**2.95**	**36.9**	**0.005**

Results based upon 114 offspring from 43 litters across 4 years

(B)

Treatment Period	Variable	b	SE	t	df	P-value
Lactation	**Intercept (2015, 0 mg, Female)**	**1.96**	**0.19**	**9.9**	**23.7**	**<0.0001**
	Year (2016)	-0.12	0.34	-0.35	22.1	0.73
	Year (2017)	-0.49	0.25	-1.94	22.5	0.065
	Sex (Male)	0.04	0.04	1.10	42.5	0.27
	Birth date	**0.25**	**0.10**	**2.46**	**22.8**	**0.021**
	Litter size	0.15	0.09	1.53	23.1	0.14
	Treatment (GCs)					
	8 mg GCs (n = 24 pups)	-0.16	0.22	-0.74	22.1	0.47
	12 mg GCs (n = 13 pups)	-0.55	0.27	-1.99	23.1	0.058

Results based upon 72 offspring from 30 litters across 3 years

Table S2. Effects of treating female red squirrels with GCs during (A) pregnancy or (B) lactation on offspring haematocrit levels (packed red blood cell volume) collected from weaned offspring. Results for the pregnancy model contained random intercept term for litter identity (pregnancy: $\sigma^2 = 18.8$) whereas results for the lactation model are from a general linear model.

(A)

Treatment Period	Variable	b	SE	*t*	df	*P*-value
Pregnancy	Intercept (2015, Control, Female)	**46.6**	**3.3**	**14.2**	**18.5**	**<0.0001**
	Year (2016)	-4.93	3.5	-1.42	17.0	0.17
	Year (2017)	-4.78	3.3	-1.45	16.5	0.17
	Sex (Male)	1.88	1.1	1.75	16.2	0.10
	Birth date	-0.39	1.2	-0.31	18.4	0.76
	Growth	-1.14	1.3	-0.88	29.9	0.38
	Litter size	-0.75	1.2	-0.62	17.4	0.54
	Treatment (GCs)	-0.45	2.1	-0.21	18.8	0.84
	Treatment (GCs) x Growth	1.85	2.2	0.85	29.7	0.40

Results based upon 39 offspring from 25 litters across 3 years

(B)

Treatment Period	Variable	b	SE	t	df	P-value
Lactation	**Intercept (2015, Control, Female)**	**44.5**	**2.3**	**19.4**	**15**	**<0.0001**
	Year (2016)	**-6.35**	**2.9**	**-2.17**	**15**	**0.046**
	Year (2017)	-4.16	2.3	-1.77	15	0.096
	Sex (Male)	**5.27**	**2.0**	**2.57**	**15**	**0.021**
	Birth date	**3.99**	**1.8**	**2.20**	**15**	**0.04**
	Growth	-2.13	1.7	-1.23	15	0.24
	Litter size	2.76	1.9	1.46	15	0.16
	Treatment (GCs)	2.27	2.3	0.98	15	0.34
	Treatment (GCs) x Growth	2.56	2.3	1.09	15	0.29

Results based upon 24 offspring from 16 litters across 3 years

Table S3. Effects of treating pregnant red squirrels with GCs on oxidative stress levels in (A) blood, (B) heart, and (C) liver tissue from weaned offspring. High PC scores correspond to low levels of antioxidants and, for heart, higher levels of protein damage (see Table 1). Models for blood and liver tissues contained random intercept term for litter ID (blood: $\sigma^2 = 0.32$; liver: $\sigma^2 = 0.04$).

(A)

Offspring trait	Variable	b	SE	t	df	*P*-value
Blood PC2	Intercept (2015, Control, Female)	-0.61	0.53	-1.14	14.0	0.27
	Year (2016)	0.44	0.57	0.76	13.8	0.46
	Year (2017)	0.32	0.54	0.59	13.6	0.56
	Sex (Male)	**0.58**	**0.28**	**2.06**	**23.8**	**0.050**
	Birth date	**-0.50**	**0.22**	**-2.29**	**18.9**	**0.034**
	Growth	-0.15	0.25	-0.62	23.5	0.54
	Litter size	-0.37	0.21	-1.79	17.4	0.09
	Treatment (GCs)	0.21	0.37	0.57	16.6	0.57
	Treatment (GCs) x Growth	-0.57	0.42	-1.33	21.0	0.20

(B)

Offspring trait	Variable	b	SE	t	df	*P*-value
Heart PC2	Intercept (2015, Control, Female)	-0.69	0.51	-1.34	32	0.19
	Year (2016)	0.99	0.55	1.78	32	0.084
	Year (2017)	0.62	0.52	1.19	32	0.24
	Sex (Male)	-0.09	0.34	-0.26	32	0.79
	Birth date	0.34	0.22	1.52	32	0.14
	Growth	-0.003	0.25	-0.01	32	0.99
	Litter size	0.41	0.21	1.94	32	0.06
	Treatment (GCs)	0.27	0.37	0.73	32	0.47
	Treatment (GCs) x Growth	0.39	0.43	0.91	32	0.37

(C)

Offspring trait	Variable	b	SE	t	df	*P*-value
Liver PC1	**Intercept (2015, Control, Female)**	**-1.02**	**0.38**	**-2.71**	**12.4**	**0.018**
	Year (2016)	0.60	0.41	1.48	12.1	0.16
	Year (2017)	**1.76**	**0.38**	**4.63**	**12.1**	**0.0006**
	Sex (Male)	0.02	0.24	0.09	28.7	0.93
	Birth date	0.04	0.16	0.25	18.0	0.81
	Growth	-0.21	0.18	-1.14	18.6	0.27
	Litter size	0.09	0.15	0.57	17.3	0.57
	Treatment (GCs)	-0.28	0.27	-1.02	14.6	0.32
	Treatment (GCs) x Growth	-0.07	0.31	-0.24	16.3	0.81

Results from 41 offspring from 26 litters over 3 years.

Table S4. Effects of treating female red squirrels with GCs during (A) pregnancy or (B) lactation on liver telomere lengths (kb) of weaned offspring. Telomeres measured in DNA from liver tissue using the TRF method. Models contained random intercept term for litter identity (pregnancy: $\sigma^2 = 0.96$; lactation: $\sigma^2 = 6.7$).

(A)

Treatment Period	Variable	b	SE	t	df	P-value
Pregnancy	**Intercept (2015, Control, Female)**	**20.59**	**1.40**	**14.7**	**15.5**	**<0.0001**
	Year (2016)	**3.69**	**1.41**	**2.61**	**13.0**	**0.022**
	Year (2017)	-3.07	1.63	-1.88	19.0	0.076
	Sex (Male)	0.33	0.76	0.43	26.4	0.67
	Birth date	0.54	0.54	1.01	18.2	0.32
	Growth	-0.30	0.62	-0.49	20.7	0.63
	Litter size	-0.39	0.51	-0.76	17.7	0.45
	Liver PC1	0.23	0.57	0.41	30.8	0.69
	Treatment (GCs)	0.42	0.92	0.45	15.5	0.65
	Treatment (GCs) x Growth	1.18	1.04	1.14	17.5	0.27

Results based upon 41 offspring from 26 litters across 3 years

(B)

Treatment Period	Variable	b	SE	t	df	P-value
Lactation	**Intercept (2015, Control, Female)**	**19.03**	**1.97**	**9.67**	**14.9**	**<0.0001**
	Year (2016)	2.88	2.61	1.10	11.5	0.29
	Year (2017)	0.29	2.68	0.11	15.8	0.91
	Sex (Male)	0.12	1.04	0.11	11.1	0.91
	Birth date	-0.09	1.24	-0.07	12.1	0.94
	Growth	-0.08	0.86	-0.09	16.6	0.93
	Litter size	0.57	1.52	0.37	11.9	0.71
	Liver PC1	-0.41	0.85	-0.48	16.2	0.64
	Treatment (GCs)	0.52	1.49	0.35	11.3	0.73
	Treatment (GCs) x Growth	1.03	1.17	0.88	14.1	0.39

Results based upon 27 offspring from 18 litters across 3 years

Table S5. Effects of treating lactating red squirrels with GCs on oxidative stress levels in (A) blood, (B) heart, and (C) liver tissue from weaned offspring. High PC scores correspond to low levels of antioxidants and, in heart tissue, higher levels of protein damage (Table 1). The model for liver contained a random intercept term for litter identity (liver: $\sigma^2 = 0.33$).

(A)

Offspring trait	Variable	b	SE	*t*	df	*P*-value
Blood PC2	Intercept (2015, Control, Female)	0.21	0.52	0.40	18	0.69
	Year (2016)	-0.16	0.73	-0.22	18	0.83
	Year (2017)	-0.56	0.57	-0.99	18	0.34
	Sex (Male)	-0.53	0.49	-1.06	18	0.30
	Birth date	-0.23	0.39	-0.59	18	0.56
	Growth	0.39	0.33	1.17	18	0.26
	Litter size	-0.42	0.46	-0.92	18	0.37
	Treatment (GCs)	0.44	0.44	1.01	18	0.32
	Treatment (GCs) x Growth	-0.29	0.47	-0.62	18	0.54

(B)

Offspring trait	Variable	b	SE	t	df	*P*-value
Heart PC2	**Intercept (2015, Control, Female)**	**-1.14**	**0.41**	**-2.78**	**18**	**0.012**
	Year (2016)	0.55	0.57	0.97	18	0.35
	Year (2017)	0.84	0.44	1.87	18	0.08
	Sex (Male)	0.36	0.39	0.92	18	0.37
	Birth date	0.23	0.31	0.76	18	0.46
	Growth	-0.09	0.26	-0.36	18	0.72
	Litter size	0.27	0.36	0.74	18	0.47
	Treatment (GCs)	0.58	0.34	1.68	18	0.11
	Treatment (GCs) x Growth	-0.16	0.37	-0.44	18	0.66

(C)

Offspring trait	Variable	b	SE	t	df	*P*-value
Liver PC1	**Intercept (2015, Control, Female)**	**-1.35**	**0.40**	**-3.38**	**11.9**	**0.005**
	Year (2016)	0.71	0.62	1.14	9.6	0.28
	Year (2017)	**2.24**	**0.47**	**4.81**	**9.9**	**0.0007**
	Sex (Male)	0.12	0.31	0.40	14.1	0.69
	Birth date	-0.18	0.31	-0.59	11.4	0.57
	Growth	-0.29	0.23	-1.25	17.6	0.22
	Litter size	-0.35	0.37	-0.93	10.7	0.37
	Treatment (GCs)	-0.12	0.37	-0.32	10.1	0.75
	Treatment (GCs) x Growth	-0.13	0.33	-0.40	17.9	0.69

Results from 27 offspring from 18 litters over 3 years.