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Supplementary material

Appendix 1

Table A1| Results from linear mixed-effects models estimating fixed and random effects explaining variation in egg and yolk mass. Egg position was fitted as a covariate, and random slopes were fitted for female identity with respect to egg position. We present fixed (β) and random (σ^2) parameters with their 95% credible intervals (CrI) in brackets. All explanatory variables were mean centered; hence the intercept refers to the average value of covariates. Fixed factors with a statistically meaningful effect (i.e., if zero is not included within the 95% CrI) is presented in bold. Estimates and CrI of '0.00' represent an effect smaller than 0.01.

	Egg mass	Yolk mass
Fixed factors β (95% CrI)		
Intercept	1.60 (1.53; 1.68)	0.29 (0.27; 0.30)
Egg position[a]	**0.04 (0.01; 0.06)**	0.01 (-0.00; 0.01)
Random factors σ^2 (95% CrI)		
Among-female variance		
V elevation[b]	0.02 (0.01; 0.02)	0.00 (0.00; 0.00)
V slopes[c]	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
Cor elevation-slopes[d]	-0.31 (-0.59; 0.003)	-0.32 (-0.67; 0.12)
Residual variance	0.00 (0.00; 0.01)	0.00 (0.00; 0.00)

[a] Egg number corrected by total clutch size.

[b] Total amount of variation in reaction norm elevation among-females.

[c] Total amount of variation in reaction norm slopes among-females.

[d] Elevation-slope correlation.

Table A2| Mean concentrations of steroid hormones and antioxidants, and mean proportions of groups of fatty acids in great tit egg yolks from 11 clutches. The total number of eggs analyzed per component is indicated within brackets.

Mean ± SE (*n*)	
Steroid hormone concentrations (pg/mg)	
Androstenedione	21.86 ± 0.73 (93)
5α-dihydrotestosterone	12.82 ± 0.45 (93)
Testosterone	22.21 ± 0.96 (93)
Corticosterone	0.17 ± 0.01 (93)
Antioxidant concentrations (standard micromolar)[a]	
Vitamin E	1.34 ± 0.09 (92)
Lutein	133.32 ± 11.52 (92)
Zeaxanthin	6.40 ± 0.61 (90)
Ratio Lutein/Zeaxanthin	23.65 ± 0.86 (90)
Carotenoids	139.48 ± 12.13 (90)
% of total fatty acid content[b]	
SFA	27.88 ± 0.25 (93)
MUFA	46.10 ± 0.14 (93)
ω-3 PUFA	3.81 ± 0.22 (93)
ω-6 PUFA	22.21 ± 0.38 (93)
Ratio ω-6/ ω-3 PUFA	7.11 ± 0.28 (93)

[a] Vitamin E, α-tocopherol; Carotenoids, sum of lutein and zeaxanthin.

[b] SFA, saturated fatty acids; MUFA monounsaturated fatty acids; PUFA, polyunsaturated fatty acids.

Table A3| Overall relative abundance (% of total fatty acid content) and classification of fatty acids in great tit egg yolks.

Fatty acid[a]	C:Dn-x[b]	Fatty acid group[c]	Mean % ± SE (*n* = 93)
Myristic acid	14:0	SFA	0.44 ± 0.03
Pentadecanoic acid	15:0	SFA	0.06 ± 0.002
Palmitic acid	16:0	SFA	19.11 ± 0.28
Margaric acid	17:0	SFA	0.47 ± 0.01
Stearic acid	18:0	SFA	7.80 ± 0.08
Myristoleic acid	14:1	MUFA	0.02 ± 0.004
Hexadecenoic acid	16:1n-9	MUFA	1.34 ± 0.03
Palmitoleic acid	16:1n-7	MUFA	1.09 ± 0.06
Oleic acid	18:1n-9	MUFA	40.92 ± 0.15
cis-Vaccenic acid	18:1n-7	MUFA	1.27 ± 0.03
Eicosenoic acid	20:1n-9	MUFA	1.44 ± 0.05
α-Linolenic acid	18:3n-3	ω-3 PUFA	2.22 ± 0.19
Eicosapentaenoic acid	20:5n-3	ω-3 PUFA	0.26 ± 0.01
Docosapentaenoic acid	22:5n-3	ω-3 PUFA	1.07 ± 0.04
Docosahexaenoic acid	22:6n-3	ω-3 PUFA	0.26 ± 0.01
Linoleic acid	18:2n-6	ω-6 PUFA	19.66 ± 0.34
Eicosadienoic acid	20:2n-6	ω-6 PUFA	0.28 ± 0.01
dihomo-ϒ-Linolenic acid	20:3n-6	ω-6 PUFA	0.25 ± 0.005
Arachidonic acid	20:4n-6	ω-6 PUFA	1.86 ± 0.04
Docosapentaenoic acid	22:5n-6	ω-6 PUFA	0.16 ± 0.01

[a] Trivial names of fatty acids are given if commonly used.

[b] C:Dn-x, number of carbon atoms:number of double bonds and position.

[c] SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids.

Table A4| Results from linear mixed-effects models estimating fixed and random effects explaining variation in yolk components and the variation among females. Egg position, mean ambient temperature and female body condition were fitted as covariates, and random slopes were fitted for female identity with respect to egg position. We present fixed (β) and random (σ^2) parameters with their 95% credible intervals (CrI). All explanatory variables were mean centered; hence the intercept refers to the average value of covariates. Fixed factors with a statistically meaningful effect (i.e., if zero is not included within the 95% CrI) are given in bold font. Estimates and CrI of '0.00' represent an effect smaller than 0.01.

[a] A4, androstenedione; DHT, 5α-dihydrotestosterone; Testo, testosterone; Cort, corticosterone.

Concentrations of A4, DHT and Testo were square root transformed.

[b] Vit E, vitamin E (α-tocopherol); Lut, lutein; Zea, zeaxanthin; Carot, sum of lutein and zeaxanthin.

Concentrations of Vit E and Carot were square root transformed; Zea was $\log_{10}$ transformed.

[c] SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids.

All fatty acid proportions were logit transformed; the total ω-6/total ω-3 PUFA ratios were $\log_{10}$ transformed.

[d] Egg number corrected by the clutch size.

[e] Mean ambient temperature for the 3 days prior to the lay date of each egg.

[f] Scaled body mass index.

[g] Total amount of variation in reaction norm elevation among-females.

[h] Total amount of variation in reaction norm slopes among-females.

[i] Elevation-slope correlation.

	Steroid hormones[a]				**Antioxidants[b]**				**Fatty acids[c]**				
	A4	DHT	Testo	Cort	Vit E	Lut	Zea	Carot	SFA	MUFA	ω-3 PUFA	ω-6 PUFA	ω-6/ω-3 PUFA
Fixed factors β (95% CrI)													
Intercept	4.58 (4.28; 4.89)	3.55 (3.32; 3.78)	4.73 (4.38; 5.06)	0.18 (0.15; 0.21)	1.01 (0.89; 1.14)	118.94 (88.16; 149.36)	1.21 (0.84; 1.57)	10.22 (8.73; 11.72)	-0.97 (-1.03; -0.92)	-0.15 (-0.18; -0.13)	-3.42 (-3.56; -3.29)	-1.21 (-1.28; -1.14)	1.99 (1.81; 2.16)
Egg position[d]	-0.02 (-0.16; 0.12)	**-0.17 (-0.29; -0.04)**	0.09 (-0.10; 0.26)	-0.00 (-0.03; 0.02)	**-0.16 (-0.24; -0.08)**	**-32.21 (-58.31; -6.53)**	**-0.29 (-0.55; -0.04)**	**-1.55 (-2.59; -0.52)**	**0.03 (0.00; 0.05)**	0.01 (-0.00; 0.02)	0.04 (-0.02; 0.09)	**-0.05 (-0.08; -0.01)**	-0.07 (-0.15; 0.00)
Mean ambient temperature[e]	0.03 (-0.13; 0.19)	0.09 (-0.00; 0.17)	0.14 (-0.07; 0.34)	**-0.03 (-0.05; -0.01)**	0.01 (-0.08; 0.09)	0.75 (-21.42; 23.38)	0.02 (-0.26; 0.30)	0.06 (-1.04; 1.15)	-0.00 (-0.01; 0.01)	**-0.01 (-0.02; -0.00)**	-0.02 (-0.05; 0.01)	**0.02 (0.00; 0.03)**	0.03 (-0.01; 0.07)
Female body condition[f]	-0.18 (-0.48; 0.14)	**-0.30 (-0.53; -0.05)**	-0.24 (-0.58; 0.09)	0.02 (-0.01; 0.05)	**0.15 (0.03; 0.26)**	17.29 (-8.38; 43.30)	0.22 (-0.16; 0.59)	0.78 (-0.64; 2.19)	-0.00 (-0.05; 0.05)	0.02 (-0.00; 0.04)	-0.03 (-0.17; 0.11)	-0.02 (-0.08; 0.04)	0.04 (-0.14; 0.21)
Random factors σ^2 (95% CrI)													
Among-female variance													
V elevation[g]	0.16 (0.08; 0.31)	0.11 (0.07; 0.18)	0.18 (0.07; 0.36)	0.00 (0.00; 0.00)	0.02 (0.01; 0.04)	1714.79 (603.69; 3655.31)	0.17 (0.06; 0.36)	3.27 (1.15; 6.98)	0.01 (0.00; 0.01)	0.00 (0.00; 0.00)	0.04 (0.03; 0.07)	0.01 (0.01; 0.02)	0.06 (0.05; 0.11)
V slopes[h]	0.06 (0.05; 0.13)	0.02 (0.02; 0.07)	0.08 (0.07; 0.14)	0.00 (0.00; 0.00)	0.01 (0.01; 0.02)	997.40 (942.53; 1179.50)	0.09 (0.09; 0.15)	1.80 (1.73; 2.59)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.01 (0.01; 0.03)	0.00 (0.00; 0.00)	0.01 (0.01; 0.05)
Cor elevation-slopes[i]	**-0.84 (-0.96; -0.60)**	0.44 (-0.02; 0.77)	**-0.79 (-0.95; -0.51)**	-0.41 (-0.81; 0.12)	**-0.70 (-0.93; -0.29)**	**-0.84 (-0.97; -0.59)**	**-0.69 (-0.93; -0.26)**	**-0.71 (-0.93; -0.31)**	0.35 (-0.21; 0.75)	**-0.71 (-0.93; -0.27)**	-0.07 (-0.44; 0.33)	**0.52 (0.05; 0.79)**	0.01 (-0.41; 0.42)
Residual variance	0.38 (0.27; 0.53)	0.09 (0.07; 0.13)	0.46 (0.65; 0.90)	0.00 (0.00; 0.01)	0.12 (0.09; 0.17)	6324.37 (4540.44; 8786.69)	1.19 (0.85; 1.66)	17.33 (12.47; 23.94)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.01 (0.01; 0.02)	0.00 (0.00; 0.00)	0.02 (0.01; 0.02)