

Supplementary material

Table A1. Macronutrient components of grain mixtures in food treatment.

Name of grain mixture	Tortelduivenvoer (KASPER™ 6721)	Sierduivenvoer (KASPER™ 6712)	Duivenkorrel ^a (KASPER™ P40)	grain mixture with broken corns
Protein	11.90%	13.30%	15.60%	10.10%
Fat	5.20%	3.40%	2.80%	2.40%
Cellulose	6%	4.40%	2.10%	2.80%
Ash	2.40%	2.40%	4%	1.60%

^a also contains calcium 0.6%, potassium 0.6%, lysine 6g, sodium 0.1%, E 672 vitamin A 19000 IE/kg, vitamin E 100 IE/kg, E 671 vitamin D3 300 IE/kg, and copper 12mg/kg

Table A2. Comparison of food impoverished and restricted groups between the experiments in 2012 and 2013.

	2012	2013
Start	1-2 days prior to chick hatching	1-2 days prior to chick hatching
End	Day 26 after chick hatching	Day 8 after chick hatching
Duration	27-28 days for parents; 26 days for chicks	9-10 days for parents; 8 days for chicks
Amount of food	33 g/pair/day	33 g/pair/day
Additional food provided after chick hatching	none	5 g/chick/day

Table A3. Effect sizes for the variables of interest. For binomial data (pair-bonding behaviour, nest-box occupation, egg laying, and pair formation), Yule’s Q was calculated using the calculator from Psychometrica (Lenhard and Lenhard 2016). IRF: Impoverished and restricted food

Response variable	Treatment		Incidence	No incidence	N	Odds ratio	Yule’s Q
Pair-bonding behaviour	Food	IRF	3	10	13	0.1826	-0.6912
		ad-libitum	23	14	37		
Nest-box occupation	Food	IRF	8	5	13	0.4414	-0.3876
		ad-libitum	29	8	37		
Egg laying	Food	IRF	2	6	8	0.1333	-0.7647
		ad-libitum	10	4	14		

Table A4. Effect sizes for the variables of interest. For body mass, the frequency of male courtship and aggression, and female being courted, we used the following formula to calculate Cohen's d:

$$d = \frac{\bar{x}_1 - \bar{x}_2}{SD_{pooled}}, \text{ where } SD_{pooled} = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

For interaction effect between food restriction and severity, Cohen's d was calculated by:

$$d_{interaction} = \frac{(a_1 - b_1) - (a_2 - b_2)}{2 \times \sqrt{MSE}}, \text{ where } a_1, a_2, b_1, b_2 \text{ are means of four groups of treatment combinations and } MSE \text{ is extracted from the ANOVA for the interaction. For the sake of consistency with the statistical models, square-root-transformed the data of male aggression were used to calculate effect size. IRF: Impoverished and restricted food}$$

Response variable	Treatment		Mean	SD	N	MSE of interaction	Cohen's d
Male courtship	Food	IRF	0.4917	0.2541	5	0.4178	-1.2275
		ad-libitum	1.0054		23		
	Food × Experimental run	2012 IRF	0.3472				
		2012 ad-libitum	1.1195				
		2013 IRF	0.7083				
2013 ad-libitum	0.8287						
Female being courted	Food	IRF	0.1979	0.1350	8	0.1479	-1.5911
		ad-libitum	0.5357		14		
	Food × Experimental run	2012 IRF	0.1250				
		2012 ad-libitum	0.6354				
		2013 IRF	0.2417				
2013 ad-libitum	0.4028						
Male aggression	Food	IRF	0.3061	0.3020	5	0.0774	-1.1045
		ad-libitum	0.5374		23		
	Food × Experimental run	2012 IRF	0.2257				
		2012 ad-libitum	0.5684				
		2013 IRF	0.4268				
2013 ad-libitum	0.4891						

Table A4. (cont.)

Response variable	Treatment		Mean	SD	N	MSE of interaction	Cohen's d
Body mass	Food	IRF	252.333	20.734	12		-1.2648
		ad-libitum	282.270	24,497	37		
	Food × Severity	2012 IRF	248.600			1216	-0.2944
		2012 ad-libitum	288.000				
		2013 IRF	255.000				
		2013 ad-libitum	273.867				

Table A5. Effect sizes for the predictabilities of body mass and post-fledging body mass gain on pigeon reproductive behaviour. Pearson's r is reported. For the sake of consistency, data of male aggression were also square-root-transformed (see Table 8).

Response variable	Predictor	r
Male courtship	Body mass	0.5193
	Post-fledging body mass gain	-0.4254
Female be courted	Body mass	0.6609
	Post-fledging body mass gain	-0.4303
Male aggression	Body mass	0.4814
	Post-fledging body mass gain	-0.3283

Reference

Cohen, J. 1988. Statistical Power Analysis for the Behavioral Sciences. 2nd ed. –Lawrence Erlbaum Associates.

Lenhard, W. and Lenhard, A. 2016. Calculation of Effect Sizes.

https://www.psychometrica.de/effect_size.html. - Bibergau (Germany): Psychometrica. DOI: 10.13140/RG.2.1.3478.4245