

**Table S3.** Belly size of male lions in Serengeti and Ngorongoro. Males have lower food intake during the brightest phase of the moon and in the Serengeti plains and woodlands. Plains and woodlands males have higher food intakes during the wet season.

**Male belly size: Model Summary**

Linear mixed model fit by maximum likelihood

Formula:  $avg.belly \sim luminosity + habitat + season + habitat*season + (1|pride) + (1|year)$

**Random effects:**

Groups	Name	Variance	Std.Dev.
Pride	(Intercept)	0.0068098	0.082522
Year	(Intercept)	0.0270298	0.164407
Residual		0.3754961	0.612777

Number of observations: 3827, groups: pride, 63; year, 29

**Fixed effects:**

	Estimate	Std. Error	t value
(Intercept)	2.31907	0.05391	43.02
Luminosity	-0.11262	0.02823	-3.99
PlainsHabitat	-0.37533	0.05599	-6.70
WoodlandsHabitat	-0.17724	0.05487	-3.23
WetSeason	-0.09045	0.03735	-2.42
Plains:WetSeason	0.39960	0.05267	7.59
Woodlands:WetSeason	0.15616	0.05036	3.10

**Male belly size: ANOVA Comparison of final model to the next simplest model**

♂ model w/o luminosity:  $avg.belly \sim habitat+season+habitat*season+(1|pride)+(1|year)$

♂ model w/luminosity:  $avg.belly \sim luminosity+habitat+season+habitat*season+(1|pride)+(1|year)$

	Df	AIC	BIC	logLik	$\chi^2$	Df	Pr(> $\chi^2$ )
<b>Males w/o luminosity</b>	9	7244.5	7300.8	-3613.3			
<b>Males w/luminosity</b>	10	7230.7	7293.2	-3605.3	15.871	1	6.78E-05