Table S2. Yw Strain Females Diet Response Surface Analyses

Response	Coefficient	Df	Estimate	Mean Square	F	P
log (µgTAG/fly)	(Intercept)		2.38			
	Sugar	1	0.41	82.19	698.35	<0.0001
	Yeast	1	0.12	25.13	213.55	<0.0001
	$Yeast^2$	1	-0.11	2.60	22.09	<0.0001
	Sugar·Yeast	1	0.04	0.53	4.52	0.036
	Residuals	349		0.12		
log (µgProt./fly)	(Intercept)		5.11			
	Sugar	1	-0.63	1.78	102.39	<0.0001
	Yeast	1	-0.66	14.35	824.99	<0.0001
	$Sugar^2$	1	0.09	1.92	110.19	<0.0001
	$Yeast^2$	1	0.34	0.01	0.76	0.393
	$Yeast^3$	1	-0.05	0.27	15.71	0.0002
	Sugar·Yeast	1	0.06	1.08	62.06	<0.0001
	Residuals	347		0.02		
log (TAG/Prot.)	(Intercept)		-2.20			
	Sugar	1	0.97	108.18	794.19	<0.0001
	Yeast	1	0.04	77.48	568.80	<0.0001
	$Sugar^2$	1	-0.08	1.40	10.25	0.0007
	$Yeast^2$	1	-0.12	2.97	21.78	<0.0001
	Residuals	349		0.14		
√(Eggs/fly)	(Intercept)		9.26			
	Cohort	1	0.04	0.04	0.11	0.7388
	Sugar	1	-3.34	11.98	31.89	1.805E-07
	Yeast	1	-6.27	280.18	745.84	< 2.2E-16
	$Sugar^2$	1	0.56	0.01	0.02	0.8769
	$Yeast^2$	1	1.64	77.51	206.33	< 2.2E-16
	Sugar·Yeast	1	1.27	31.65	84.26	1.217E-14
	$Sugar^2$·$Yeast^2$	1	-0.09	20.59	54.81	6.156E-11
	Residuals	92		0.38		
Age at Death (days)	(Intercept)		31.38			
	Sugar	1	9.68	NA	NA	<0.0001
	Yeast	1	14.91	NA	NA	<0.0001
	$Sugar^2$	1	-3.47	NA	NA	<0.0001
	$Yeast^2$	1	-4.64	NA	NA	<0.0001
	Sugar·Yeast	1	1.80	NA	NA	<0.0001
√(food/fly/6h)	(Intercept)		18.30			
	Sugar	1	-7.35	174.52	165.40	<0.0001
	Yeast	1	-9.50	245.39	232.60	<0.0001
	$Sugar^2$	1	2.95	7.35	6.97	0.0090
	$Yeast^2$	1	2.60	22.13	20.98	<0.0001
	$Sugar^3$	1	-0.40	21.16	20.06	<0.0001
	$Yeast^3$	1	-0.29	8.90	8.44	0.0040
	Sugar·Yeast	1	1.42	16.07	15.23	<0.0001
	$Sugar^2$·$Yeast^2$	1	-0.06	27.08	25.67	<0.0001
	Residuals	345		1.05		
log (calories/fly/6h)	(Intercept)		0.250			
	Sugar	1	-0.165	1.052	1263.00	<0.0001
	Yeast	1	-0.090	0.047	9.20	<0.0001
	$Sugar^2$	1	0.085	0.008	12.40	0.0110
	$Yeast^2$	1	0.020	0.030	55.90	<0.0001
	$Sugar^3$	1	-0.010	0.011	35.90	<0.0001
	Sugar·Yeast	1	0.025	0.013	16.10	0.0002
	$Sugar^2$·$Yeast^2$	1	-0.002	0.017	20.20	<0.0001
	Residuals	346		0.008		

Statistical analysis and best fit model for Diet Response Surface estimation (see Experimental procedures for details) presented in Figure 1A (log µgTAG/fly), 1B (log µgProt./fly) 1C (logTAG/Prot), 2A (√eggs/fly), 2B (Age at Death, days), 3A (√ (µg Food/fly/day)) and 3B(log(calories/fly/day)). With the exception of age at death estimated regression coefficient are from a multiple regression analysis, while degrees of freedom (Df), sums of squares, and F values are obtained by ANOVA. P values are obtained by randomization. For age at death, a mixed-effects linear model was fit using replicate vial cohorts as a random effect.