Consumer acceptance and willingness to pay for instant fortified cereal products in Eldoret, Kenya - Appendices

Appendix 1. Analysis of consumers' scores for different attributes and overall, using ordinal regression with random effects (base category is product A) and order effects; coefficients b can be converted to odds ratio = exp(b); all tests with 220 participants and 1100 observations)

Product	Group	Variable	Overall		Appearance		Texture in hand		Aroma		Texture in mouth		Taste	
			Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Ugali	Order	2nd	-0.03	0.18	-0.15	0.19	0.30	0.19	0.05	0.19	0.34	0.19	0.15	0.18
		3rd	0.27	0.18	-0.02	0.19	0.41	0.19 *	0.16	0.19	0.39	0.19 *	0.53	0.19 **
		4th	-0.10	0.18	-0.04	0.19	0.29	0.19	-0.16	0.19	-0.04	0.19	0.05	0.18
		5th	0.29	0.18	0.04	0.19	0.34	0.19	0.33	0.20	0.50	0.19 **	0.45	0.18 *
	Product	Sifted mixed flour	-1.09	0.19 ***	-0.96	0.19 ***	-0.75	0.19 ***	-0.43	0.20 *	-0.98	0.19 ***	-1.05	0.19 ***
		Instant sifted mixed	-0.89	0.18 ***	-0.82	0.19 ***	-0.63	0.19 **	-0.51	0.19 **	-0.82	0.19 ***	-0.84	0.19 ***
		Instant whole mixed	-0.43	0.18 *	-0.65	0.19 **	-0.38	0.19	-0.05	0.19	-0.21	0.19	-0.44	0.19 *
		Sifted mixed, fortified	-1.61	0.19 ***	-1.49	0.20 ***	-0.88	0.19 ***	-1.35	0.20 ***	-1.43	0.19 ***	-1.60	0.20 ***
	Model	sigma2_u	0.32	0.12	0.75	0.17	0.70	0.17	1.00	0.21	0.63	0.16	0.46	0.14
		Wald chi2(4)	88		61		31		64		81		87	
		Log likelihood	-1368		-1293		-1242		-1204		-1304		-1328	
Uji	Order	2nd	-0.03	0.18	-0.29	0.18	0.77	0.19 ***	-0.36	0.19	0.34	0.18	0.15	0.18
		3rd	0.18	0.18	-0.10	0.18	0.62	0.19 **	-0.02	0.19	0.63	0.18 **	0.30	0.18
		4th	-0.18	0.18	-0.38	0.18 *	0.41	0.19 *	-0.13	0.19	0.34	0.18	0.23	0.18
		5th	0.48	0.18 **	-0.17	0.18	1.03	0.20 ***	-0.15	0.19	0.72	0.19 ***	0.56	0.18 **

Product	Sifted mixed flour	0.64	0.18 ***	1.62	0.19 ***	-0.13	0.19	0.57	0.19 **	0.07	0.18	0.23	0.18
	Instant sifted mixed	0.29	0.18	0.87	0.18 ***	-0.47	0.19 *	0.21	0.19	-0.27	0.18	-0.21	0.18
	Instant whole mixed	0.76	0.18 ***	1.71	0.19 ***	0.04	0.20	0.72	0.19 ***	0.09	0.18	0.39	0.18 *
	Sifted mixed, fortified	-0.09	0.18	0.72	0.18 ***	-0.70	0.19 ***	-0.50	0.19 **	-0.41	0.18 *	-0.49	0.19 **
Model	sigma2_u	0.41	0.13	0.64	0.15	0.80	0.18	0.66	0.16	0.52	0.14	0.53	0.14
	Wald chi2(4)	47		107		50		52		30		36.84	
	Log likelihood	-1446		-1381		-1207		-1253		-1377		-1388	

Appendix 2. Factors affecting consumers' overall scores, using ordinal regression with random effects (base category is product A) (all tests with 220 participants and 1100 observations)

	Short model with cross effects				Long model		
	Coef.	SE	P>|z|		Coef.	Std. Err.	P>|z|
Mixed (with sorghum)	-0.994	0.178	0.000	***	-1.740	0.962	0.070
Whole flour	0.409	0.178	0.022	*	1.807	0.953	0.058
Instant	0.183	0.176	0.300		0.496	0.955	0.604
Fortified	-0.657	0.177	0.000	***	-0.390	0.948	0.681
Uji	-1.276	0.180	0.000	***	-1.304	0.181	0.000
Uji x mixed	1.612	0.253	0.000	***	1.645	0.254	0.000
Uji x whole flour	0.066	0.252	0.794		0.066	0.253	0.793
Uji x instant	-0.523	0.250	0.036	*	-0.528	0.251	0.035
Uji x fortified	0.297	0.251	0.237		0.306	0.253	0.225
Male					-0.005	0.191	0.980
Age (years)					0.010	0.011	0.367
Education					-0.064	0.033	0.049
married					0.470	0.269	0.081
Income (1000 KES/month)					0.000	0.002	0.995
Awareness					0.062	0.038	0.105
Mixed x male					0.477	0.267	0.074
Mixed x age					0.015	0.015	0.326
Mixed x education					0.037	0.046	0.421
Mixed x married					-0.421	0.382	0.269
Mixed x income					-0.007	0.003	0.031
Mixed x awareness					-0.028	0.054	0.599
Whole x male					-0.828	0.272	0.002
Whole x age					-0.007	0.016	0.661
Whole x education					-0.023	0.044	0.605

Whole x married			-0.973	0.392	0.013
Whole x income			-0.004	0.003	0.187
Whole x awareness			0.044	0.055	0.426
Instant x male			-0.038	0.267	0.888
Instant x age			-0.023	0.015	0.140
Instant x education			0.047	0.045	0.291
Instant x married			0.018	0.387	0.963
Instant x income			-0.015	2.260	0.091
Instant x awareness			-0.050	0.054	0.350
Fortified x male			0.345	0.270	0.202
Fortified x age			-0.010	0.015	0.508
Fortified x education			-0.036	0.045	0.431
Fortified x married			0.003	0.394	0.995
Fortified x inc			0.000	0.000	0.667
Fortified x awa			0.043	0.055	0.439
/cut1	-4.657	0.189	-4.688	0.698	
/cut2	-2.360	0.137	-2.357	0.686	
/cut3	-1.586	0.132	-1.559	0.686	
/cut4	0.744	0.127	0.841	0.685	
N	2200		2200.000		
LR chi2(19)	117.73		208.53		
Prob > chi2	0		0.000		
			-		
Log-likelihood	-2840.666		2795.2631		
Pseudo R2	0.020		0.036		

Appendix 3. Analysis of WTP for improved cereal products (550 observations by 110 participants each)

	WTP Group 1 A (no information)			WTP Group 1B (with information)			Group 2 (with information)		
	Coef.	Std. Err.	P>|z|	Coef.	Std. Err.	P>|z|	Coef.	Std. Err.	P>|z|
Mixed	5.37	1.35	0.000	6.42	1.20	0.000	4.04	1.22	0.001
Whole	-1.18	1.35	0.380	0.35	1.20	0.773	0.14	1.23	0.910
Instant	2.07	1.35	0.124	3.59	1.20	0.003	4.06	1.23	0.001
Fortified	1.41	1.35	0.295	7.75	1.20	0.000	6.00	1.22	0.000
_cons	23.73	1.97	0.000	18.16	1.45	0.000	17.97	1.46	0.000
sigma_u	18.18			12.38			12.30		
sigma_e	9.99			8.89			9.07		
rho	0.77			0.66			0.65		
Rsq within	0.104			0.349			0.253		
Rsq between	0.000			0.000			0.041		
Rsq overall	0.021			0.128			0.092		

Appendix 4. Analysis of WTP for improved cereal product using the long model

	WTP Group 1 A (no information)			WTP Group 1B (with information)			Group 2 (with information)		
	Coef.	Std. Err.	P>|z|	Coef.	Std. Err.	P>|z|	Coef.	Std. Err.	P>|
Mixed (with sorghum)	-7.31	3.85	0.058	-1.75	3.33	0.599	8.15	3.43	0.0
Whole flour	-1.18	1.33	0.374	0.35	1.18	0.769	0.13	1.21	0.9
Instant	5.95	3.38	0.079	9.85	2.99	0.001	2.09	3.03	0.4
Fortified	-3.87	3.62	0.285	0.85	3.19	0.791	11.22	3.02	0.0
Monthly income (Sh 1000)	0.09	0.06	0.107	0.09	0.04	0.020	0.02	0.03	0.4
Education	0.43	0.62	0.495	-0.24	0.44	0.586	0.60	0.39	0.1
Male x fortified	0.37	2.19	0.867	-2.06	1.93	0.286	-8.01	2.03	0.0
Age x mixture	0.34	0.10	0.000	0.22	0.08	0.009	-0.11	0.09	0.2
Age x instant	-0.10	0.08	0.214	-0.17	0.07	0.023	0.05	0.08	0.4
Awareness x fortified	0.74	0.44	0.091	1.22	0.39	0.002	0.04	0.36	0.9
Constant	15.17	7.87	0.054	18.70	5.59	0.001	9.08	4.92	0.0
sigma_u	17.45			12.11			12.20		
sigma_e	9.88			8.75			8.94		
Rho	0.76			0.66			0.65		
R-sq: within	0.11			0.38			0.28		
R-sq: between	0.09			0.09			0.07		
R-sq: overall	0.09			0.19			0.14		