

Acceptability of Meat Tax and Subsidy Removal by Meat-Eaters: Insights from Five European Countries

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Abstract

Governments worldwide are exploring policies aimed at promoting healthier and more sustainable dietary choices. This study examines the public acceptability of two promising yet controversial policy interventions: the introduction of a meat tax and the removal of meat subsidies. Drawing on existing literature about the impact of policies on food consumption, particularly meat, we analyze data from a multi-country survey conducted across five European countries. We employ ordered logistic models and latent cluster analysis to examine factors influencing respondents' support for these policies. Our findings highlight the role of value-based, diet-related and socio-demographic factors. Notably, respondents from Spain, Portugal, and the UK showed significantly greater support for these meat policies compared to Latvians and Czechs. Age emerged as a key factor, indicating an increasing likelihood of support for both policies among younger individuals. Moreover, environmental and egoistic values were associated with increased odds of support, while security concerns and hedonic values had the opposite effect. Neither income nor employment emerged as significant predictors. Our study underscores the complexity of public opinions toward meat policies and provides valuable insights for policymakers seeking to design effective strategies to promote healthier and more sustainable dietary behaviours in Europe.

JEL Classification C34, C38, I15, O12, O13, Q56

Keywords policy acceptability, diet, meat policies, meat tax, meat subsidy removal, values

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Authors' contributions

Diana Kmeťková - Conceptualization, Formal Analysis, Investigation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing

Iva Zvěřinová - Data curation, Conceptualization, Methodology, Project administration, Software, Writing – review & editing

Milan Ščasný - Funding acquisition, Resources, Supervision, Conceptualization, Data curation, Methodology, Project administration, Writing – review & editing

Vojtěch Máca - Data curation, Conceptualization, Methodology, Project administration, Software, Writing – review & editing

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Competing interests

The authors declare that they have no competing interests.

Data Availability Statement

The datasets used and analysed during the current study are available from the corresponding author upon reasonable request.

A Supplementary Information

A.1 Figures

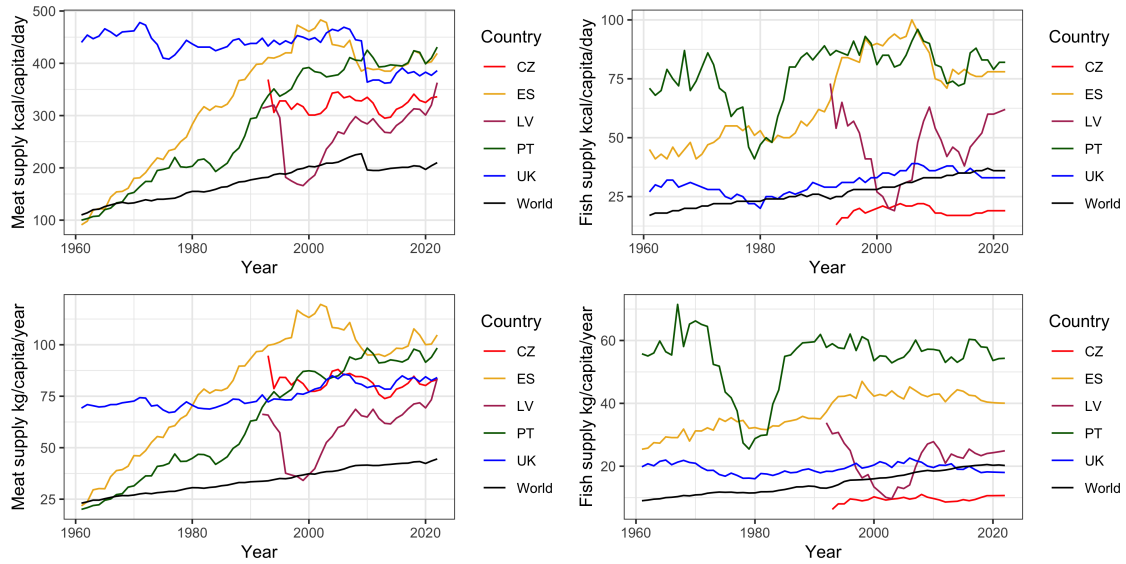


Figure A.1: Long-run trends in meat (left) and fish and seafood (right) supply expressed in kcal/capita/day (top) and kg/capita/year (bottom) by country from 1960 (if applicable) until 2022. Created by authors using data from ? for five European countries - Czech Republic (CZ), Spain (ES), Latvia (LV), Portugal (PT), United Kingdom (UK), and global average (World).

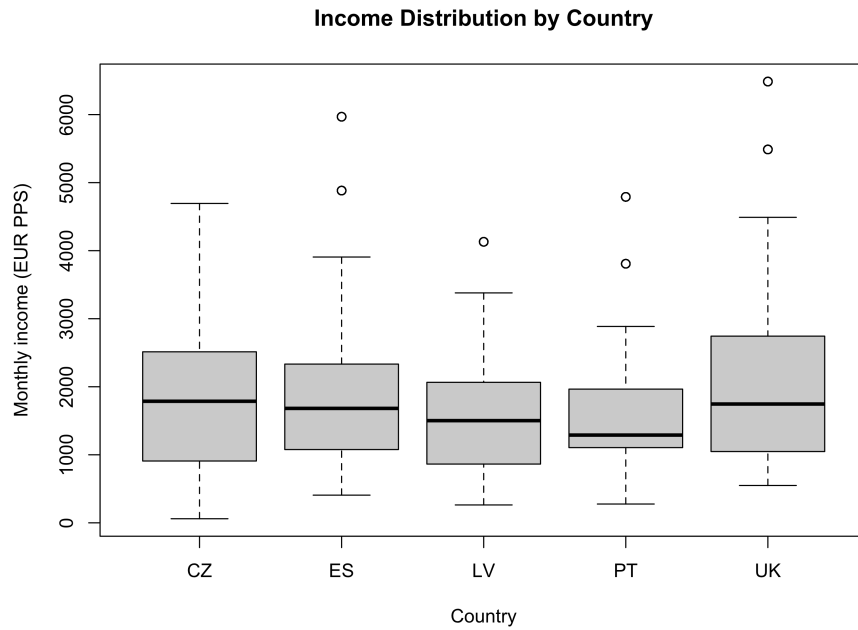


Figure A.2: Income distribution by country (adjusted by purchasing parity to PPS euros): Box Plot.

Different people have different values. Please indicate on the following scale how important each of these is as a guiding principle in your life.

	Opposed to my values	Not impor- tant			Impor- tant			Very impor- tant	Of supreme impor- tance
	-1	0	1	2	3	4	5	6	7
Reciprocation of favours (avoidance of indebtedness)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wealth (material possessions, money)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Enjoying life (enjoying food, sex, leisure etc.)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Self-indulgence (doing pleasant things)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sense of belonging (feeling that others care about me)	☐	☐	☐	☐	☐	☐	☐	☐	☐
A world of peace (free of war and conflicts)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Family security (safety for loved ones)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Influence (having an impact on people and events)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Equality (equal opportunity for all)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Protecting the environment (preserving nature)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Social justice (righting injustice, care for the weak)	☐	☐	☐	☐	☐	☐	☐	☐	☐

Figure A.3: Value items used to construct the value variables

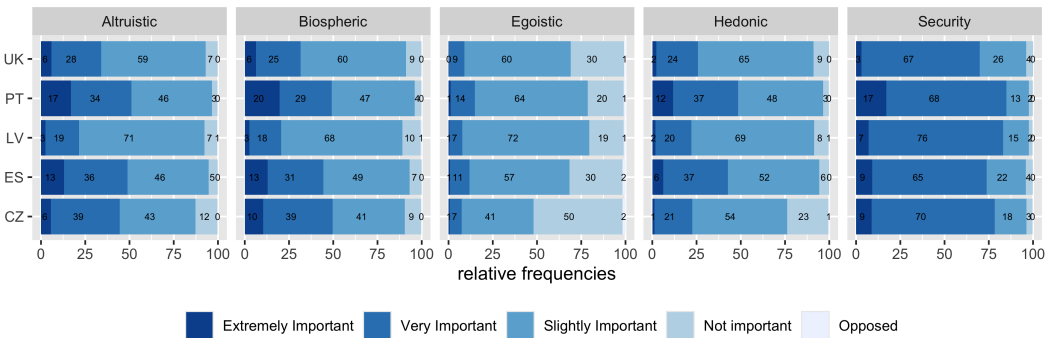


Figure A.4: Relative distribution of value variables by country.

How many portions of **WHITE FISH** do you eat?
(not in batter or breadcrumbs and not oily fish, such as salmon or trout)

☐ None

☐ Less than one portion a month

☐ Less than one portion a week

☐ One portion per week

☐ 2-3 portions per week

☐ 4-6 portions per week

☐ 7+ portions per week

One portion is e.g.:
the size of your hand including fingers

continue

Figure A.5: Example question on white fish consumption.

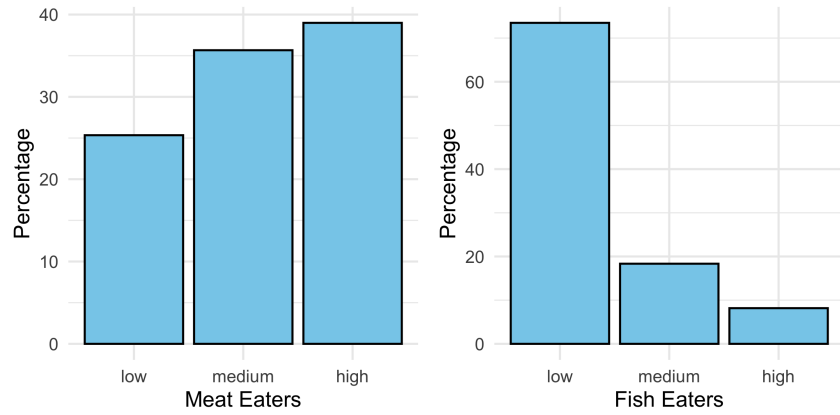


Figure A.6: Relative distribution of meat and fish eaters by consumption level - low (<50 g/day), moderate (50-100 g/day), high (> 100g/day).

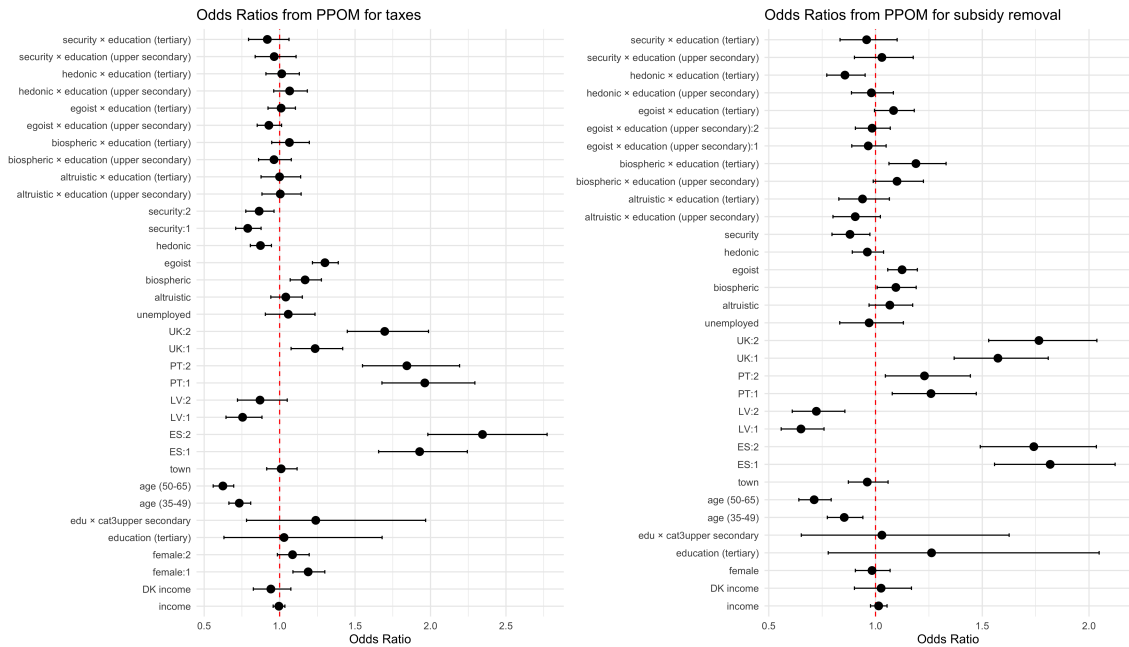


Figure A.7: Odds Ratios from PPOM regression with interactions for meat taxes (left) and meat subsidy removal (right). Non-parallel slopes denoted as "VariableName:1" (Opposed vs. Neutral or Supportive) and "VariableName:2" (Opposed or Neutral vs. Supportive).

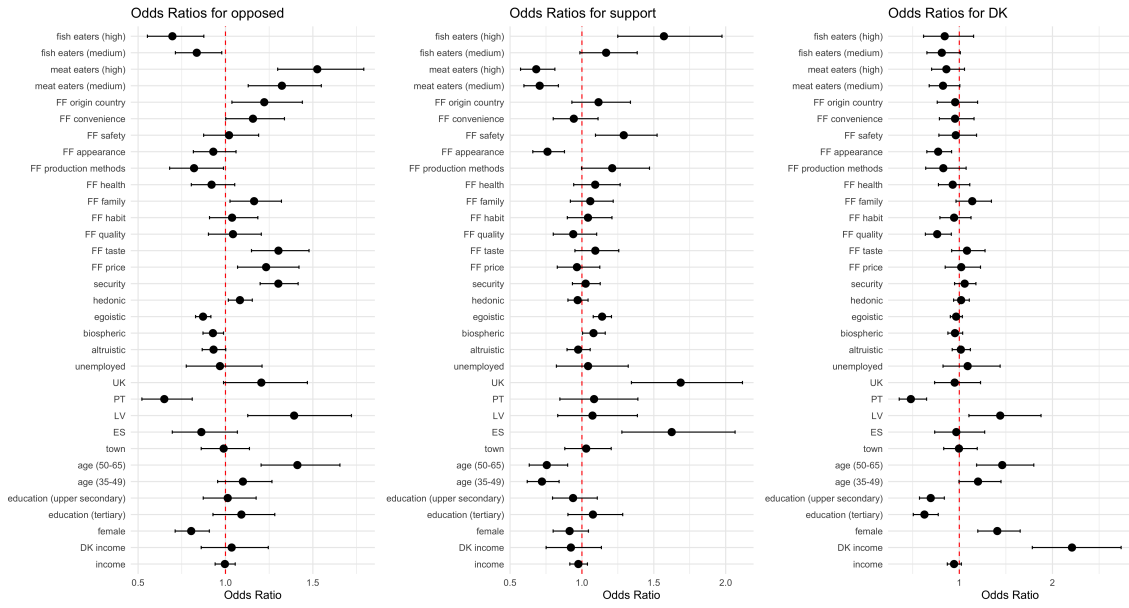


Figure A.8: Odds Ratios from MNLM regression for meat taxes.

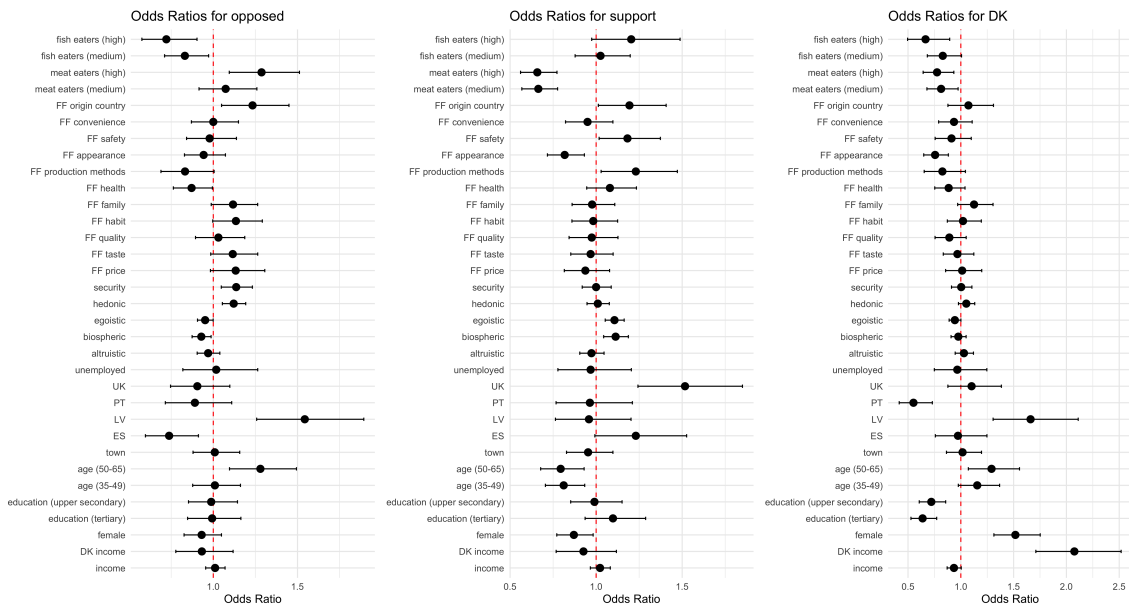


Figure A.9: Odds Ratios from MNLM regression for meat subsidy removal.

A.2 Tables

Table A.1: The number of completed questionnaires in the pilot and the main wave, the number of excluded non-valid observations, and the final sample (excluding non-valid observations).

	Pilot	Main wave	Non-valid	Final sample
Czech Republic	212	1,926	119	2,019
Latvia	282	1,646	146	1,782
Portugal	246	1,584	172	1,658
Spain	323	1,964	220	2,067
United Kingdom	315	2,702	197	2,820
Total	1,378	9,822	854	10,346

Table A.2: Relative frequencies of respondents' opinions on the introduction of a meat tax and meat subsidy removal. DK stands for 'did not know' or 'did not want to answer'.

	DK	opposed	neutral	support
meat tax introduction	12	48	15	25
meat tax introduction		55	18	28
meat subsidy removal	16	35	18	31
meat subsidy removal		41	22	37

Table A.3: Summary of categorical and binary data used in the analysis, presenting both unconditional proportions (All) and conditional proportions for the Czech Republic (CZ), Spain (ES), Latvia (LV), Portugal (PT), and the United Kingdom (UK), expressed as percentages. The dataset consists of 10,070 observations.

Variable	Coding Name	All	CZ	ES	LV	PT	UK
Gender (binary)							
Female	female	51	51	50	54	47	54
Age (categorical)							
18-34 yrs	base	33	31	30	33	36	35
35-49 yrs	age_cat335-49 yrs	38	38	42	35	40	34
50-65 yrs	age_cat350-65 yrs	29	31	28	32	24	31
Education (categorical)							
Primary & lower secondary	base	30	43	39	9	38	21
Upper secondary	edu_cat3upper secondary	38	37	27	58	34	39
Tertiary	edu_cat3tertiary	32	20	34	33	28	40
Municipality size (binary)							
Town or City	town_cat2town	75	62	87	69	77	79
Economic factors (dummy variables)							
DK_income	DK_income	14	13	9	21	15	13
Unemployed	unemployed	8	3	16	6	11	6
Food factors (dummy variables)							
Price	FF.price	76	77	65	84	85	74
Taste	FF.taste	58	61	52	60	28	75
Quality	FF.quality	74	73	75	73	80	71
Habit	FF.habit	31	45	28	35	28	23
Family	FF.family	38	38	39	37	47	31
Health	FF.health	35	30	41	29	47	29
Production methods	FF.production.methods	14	9	16	14	18	16
Appearance	FF.appearance	55	69	52	62	60	42
Safety	FF.safety	24	14	30	27	33	20
Convenience	FF.convenience	25	26	22	25	15	32
Origin country	FF.origin.country	19	29	15	23	18	11
Meat eaters (categorical)							
Low	base	23	29	20	21	16	27
Medium	meat_eatersmedium	37	37	40	34	32	38
High	meat_eatershigh	40	33	39	45	52	35
Fish eaters (categorical)							
Low	base	73	93	55	87	49	76
Medium	fish_eatersmedium	19	5	30	10	33	18
High	fish_eatershigh	8	1	16	3	17	6

Table A.4: Summary statistics of continuous variables in the analysis. The dataset consists of 10,070 observations.

Variable	Coding Name	Unit	mean	sd	min	max	imputed
Income	inc.1000	1,000 EUR	1.86	1.16	0.06	6.49	1384
Altruistic	altru	9-point scale	4.84	1.36	-1	7	2733
Biospheric	biosph	ranging from 7	4.78	1.43	-1	7	2742
Egoistic	egoist	(of supreme importance)	3.02	1.36	-1	7	2747
Hedonic	hedon	to 0 (not important)	4.45	1.33	-1	7	2749
Security	secur	-1 (opposed to my values)	5.26	1.19	-1	7	2730

Table A.5: PPOM results on respondent opinions regarding the introduction of a meat tax and meat subsidy removal, categorized as opposed (base category), neutral, or supportive.

	Tax Model				Subsidy Model			
	Coef	SE	OR	p value	Coef	SE	OR	p value
(Intercept):1	0.78	0.14	2.18	0.00	0.93	0.14	2.54	0.00
(Intercept):2	-0.62	0.15	0.54	0.00	-0.36	0.14	0.69	0.01
income	-0.01	0.02	0.99	0.59	0.01	0.02	1.01	0.47
DK income	-0.08	0.07	0.93	0.27	-0.00	0.07	1.00	1.00
female:1	0.16	0.05	1.17	0.00	-0.05	0.04	0.95	0.22
female:2	0.08	0.05	1.08	0.13				
edu (tertiary)	-0.03	0.06	0.97	0.59	0.08	0.06	1.08	0.16
edu (upper secondary)	-0.06	0.05	0.94	0.28	-0.00	0.05	1.00	0.98
age (35-49)	-0.33	0.05	0.72	0.00	-0.17	0.05	0.84	0.00
age (50-65)	-0.53	0.06	0.59	0.00	-0.40	0.06	0.67	0.00
town	0.02	0.05	1.02	0.67	-0.04	0.05	0.96	0.37
ES:1	0.43	0.08	1.54	0.00	0.47	0.08	1.60	0.00
ES:2	0.60	0.09	1.82	0.00	0.36	0.08	1.44	0.00
LV:1	-0.29	0.08	0.75	0.00	-0.44	0.08	0.64	0.00
LV:2	-0.19	0.10	0.83	0.06	-0.37	0.09	0.69	0.00
PT:1	0.46	0.09	1.58	0.00	0.13	0.09	1.14	0.13
PT:2	0.39	0.10	1.48	0.00	0.01	0.09	1.01	0.94
UK:1	0.13	0.08	1.14	0.09	0.38	0.08	1.46	0.00
UK:2	0.39	0.09	1.47	0.00	0.47	0.08	1.60	0.00
unemployed	0.05	0.08	1.05	0.52	-0.04	0.08	0.96	0.62
altruistic	0.05	0.03	1.05	0.07	0.00	0.03	1.00	0.91
biospheric	0.12	0.02	1.13	0.00	0.14	0.02	1.15	0.00
egoistic	0.22	0.02	1.25	0.00	0.12	0.02	1.13	0.00
hedonic	-0.09	0.02	0.91	0.00	-0.12	0.02	0.88	0.00
security :1	-0.25	0.03	0.78	0.00	-0.10	0.03	0.91	0.00
security:2	-0.16	0.03	0.85	0.00				
FF price	-0.21	0.05	0.81	0.00	-0.15	0.05	0.86	0.00
FF taste:1	-0.20	0.05	0.82	0.00	-0.12	0.05	0.89	0.01
FF taste:2	-0.10	0.05	0.91	0.07				
FF quality	-0.09	0.05	0.91	0.07	-0.05	0.05	0.95	0.30
FF habit	-0.01	0.05	0.99	0.79	-0.13	0.05	0.88	0.01
FF family	-0.10	0.05	0.91	0.03	-0.12	0.04	0.89	0.01
FF health	0.14	0.05	1.15	0.00	0.17	0.05	1.18	0.00
FF production.methods	0.33	0.07	1.40	0.00	0.33	0.06	1.39	0.00
FF appearance:1	-0.09	0.05	0.91	0.07	-0.07	0.05	0.93	0.17
FF appearance:2	-0.20	0.05	0.82	0.00	-0.15	0.05	0.86	0.00
FF safety:1	0.12	0.06	1.13	0.03	0.15	0.05	1.16	0.00
FF safety:2	0.26	0.06	1.29	0.00				
FF convenience	-0.17	0.05	0.84	0.00	-0.04	0.05	0.96	0.44
FF origin country	-0.10	0.06	0.91	0.09	-0.09	0.06	0.91	0.13
meat eaters (medium)	-0.51	0.06	0.60	0.00	-0.39	0.06	0.68	0.00
meat eaters (high)	-0.66	0.06	0.51	0.00	-0.55	0.06	0.58	0.00
fish eaters (medium)	0.28	0.06	1.32	0.00	0.17	0.06	1.18	0.00
fish eaters (high)	0.66	0.08	1.94	0.00	0.40	0.08	1.49	0.00
Log-likelihood	-8214				-8638			

Note: Non-parallel slopes denoted as "VariableName:1" (Opposed vs. Neutral or Supportive) and "VariableName:2" (Opposed or Neutral vs. Supportive).