Facts vs. Fake:

A Comparison of Meat Product's Nutritional Values and Nutritional Claims

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Background

- Red meat (RM) production has a negative effect on the environment[1]
- Meat (over-) consumption is associated with adverse health, especially due to the high contents of saturated fat and salt[2]
- Besides nutritional values, food additives play a crucial role for the perceived risk of consumption and naturalness of (meat) products[3]
- Producers reacted with
  - reformulations of traditional meat products and the development of meat substitutes (MS)
  - excessive use of Front of package (FOP) claims that refer to product's healthiness & naturalness which has been shown to influence consumers' decisions[4]
- Little is known i) about actual differences in nutritional values and usage of food additives between MS and RM, and ii) whether **both** are related to FOP (health) claims

Research Objectives

Investigate at the example of Germany whether:

- the nutritional quality and the use of additives differs between RM, Poultry Meat (PM) and MS innovations
- FOP information is a reliable external cue for predicting a satisfactory nutrient profile and the naturalness of the meat products

Data

- Data from Mintel's Global New Product Database[5]
- 5,482 product innovations in the German meat market from 2010 to 2018
- 65.7% RM innovations, 20.8% PM innovations and 13.5% MS innovation

Example of minus claims on a meat substitute.
Source: https://www.beyondmeat.com/ Press images.

Variables and Method

Dependent variables (DV)

- Ofcom's A-score: aggregated score for product's nutritional quality including energy, salt, saturated fat and sugar content. Range from 0 (best) to 40 (worst)
- Count variable for the number of different food additives in a product

Explanatory variables

- Dummies for RM and PM innovations
- Dummies for FOP claims/labels: minus, plus or natural
- Control variables: Price and time trend (0 to 8)

OLS and negative binomial regressions (NBREG)

Descriptive statistics

VARIABLES	Mean	Mean RM	Mean PM	Mean MS
A-Score	14.457	16.53	10.95	9.786
#Additives	2.18	2.36	1.90	1.75
Natural	0.286	0.20	0.29	0.68
Plus	0.03	0.01	0.01	0.18
Minus	0.072	0.07	0.07	0.10

Regression Results

	OLS DV: A-score				NBREG DV: #Additives			
	(All)	(RM)	(PM)	(MS)	(All)	(RM)	(PM)	(MS)
Red meat	6.713***				1.251***			
	-0.201				-0.056			
Poultry meat	1.272***				1.021			
	-0.223				-0.053			
Minus	-2.641***	-4.001***	-0.035	-1.265***	1.195***	1.086*	1.334***	1.301*
	-0.255	-0.333	-0.472	-0.459	-0.047	-0.05	-0.1	-0.186
Plus	0.357	1.788**	0.739	-0.896**	1.154*	1.398***	1.045	0.917
	-0.335	-0.726	-2.438	-0.351	-0.093	-0.156	-0.468	-0.107
Natural	0.164	0.967***	-1.078***	-1.062***	0.780***	0.913***	0.750***	0.403***
	-0.177	-0.252	-0.321	-0.299	-0.022	-0.028	-0.055	-0.03
Time	-0.256***	-0.221***	-0.296***	-0.196**	0.969***	0.977***	0.959***	0.942**
	-0.039	-0.05	-0.066	-0.085	-0.005	-0.006	-0.013	-0.022
Price: €/100g	0.241***	0	1.233***	1.582***	0.981*	0.932***	1.315***	1.319***
	-0.076	-0.086	-0.202	-0.27	-0.011	-0.013	-0.069	-0.085
Constant	10.951***	17.761***	11.553***	9.474***	2.364***	2.985***	1.841***	2.625***
	-0.304	-0.302	-0.435	-0.653	-0.13	-0.105	-0.178	-0.429
Observations	5,482	3,601	1,141	740	5,482	3,601	1,141	740
Adjusted-R^2	0.21	0.028	0.0645	0.0782				
F-Value/Wald	278.6	33.67	14.4	11.23	248.5	79.25	79.22	178

Discussion

- While previous literature presents ambiguous findings on differences in nutritional quality, our results indicate that, based on the A-score, RM and PM contain higher amounts of unfavorable nutrients than MS[6]
- Also regarding additives, MS are better than their reputation. In fact, MS contain less additives than RM. No significant difference exists compared to PM
- Across product categories, minus claims are related to lower A-scores but associated with more food additives
- While consumers would presume natural labelled products as healthier, looking at the Ofcom A-score this only holds in the case of PM and MS, but not for RM. Natural claims/labels are, however, a consistent indicator for fewer additives

Conclusion

- Our results indicate that FOP claims/labels are in many cases not a reliable cue for communicating the nutritional quality and the naturalness of the product.
- However, the kind of meat is: MS seem the better choice from the perspective of the nutritional quality and the naturalness. RM in contrast are most critical from both perspectives while PM take a middle ground.

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