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Rate of success of new dairy products in the UK: how important are health and sustainable claims?

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Abstract

This paper estimates the rate of success of new dairy products in the UK. They are an important strategy applied by manufacturers and retailers when competing. Moreover, in the current context of decreasing demand for dairy products, the strategy is seen as a way to recapture lost market. We focus on products introduced in 2011 using Mintel's GNPD and their sales were followed up to 2015 using Kantar Worldpanel data. A categorical variable was constructed based on the results and modelled using a multinomial logit. Our findings indicate all categories of claims named health, safety, environmental, demographic or convenient can be associated to the level of success of dairy products. However its significance is category specific.

Keywords New product development, UK dairy food industry, health, sustainability

JEL code O310

1 Introduction

It is well known that milk and dairy products including cheese and yoghurt, are good sources of protein and calcium. However, dairy products have also been reported to be harmful to health with negative consequences for those consumers with lactose intolerance, osteoarthritis, rheumatoid arthritis, or trying to avoid potential cardiovascular disease (Rozenberg et al., 2011) naming milk as ‘white poison’ (The grocer, 2016). As a result consumers are confused and therefore milk and some dairy products have suffered an important reduction in its per capita consumption since the 1980s.

The UK dairy market exhibits a clear decline in the per capita consumption of milk and dairy products (excluding cheese), which is only mildly compensated by a small increase of the per capita consumption of cheese. A strong explanation of such an effect is the decline in the consumption of full fat milk, which has not fully been substituted by “skimmed” milks, but with other food products such as non-dairy milk or fruit juices among others.

In order to overcome the trend observed in the market, dairy manufacturers and retailers have invested in new product development (NPD) strategies in order to reach consumer’s necessities and shift the current situation. However, new products are not always embraced by consumers and they often disappear quickly from the shelves. This means that if those products have healthy or sustainable attributes their benefits do not materialise.

This paper draws upon unique data that links new products developed in the UK dairy market to sales data and subsequently evaluate their level of success. This dataset allows assessing the effect of innovation on the market success of dairy products in the UK market. Furthermore, we examine to what extent health, sustainable and other claims in the products determine their degree of market success.

The paper is organized as follows: first a review of the literature on new product development is presented followed by a description of the UK dairy market. The third section focuses on the empirical work and the last section covers the results and discussion.

2 New product development and its role in shaping consumers choice

Today’s competitive global food market makes new product development (NPD) in the food supply chain an essential factor for firms subsistence in national and international markets (Stewart-Knox and Mitchell, 2003, Capitanio et al., 2009). NPD results from a situation in the one a firm consider that it has less number of products in the market than the ones desired (Raubitschek, 1988) and let food manufacturers to compete using a product differentiation strategy, which expands consumer purchase options with the objective of satisfying consumer actual and potential demand (Connor, 1981, Zouaghi and Sanchez, 2016).

The level of innovation when developing these new products can vary from factual innovations to imitative products depending on the magnitude of the novelty. Moreover, the level of uniqueness depends on which agent in the food system is guiding the development and how this actor understands newness (Connor, 1981), undertakes risk of failure and project benefits for the developed products.

The first approach for the developing new products implies downstream flow of changes and information. That is, manufacturers perform NPD based on their know-how to adjust their production to new available technologies, alterations in the distribution channels or new legislation among other elements (Costa and Jongen, 2006), with the outcome of products that are accepted or not by the market. Dijksterhuis (2016) stated that about 50-70 per cent of new products are removed

from the market before achieving their financial targets because there is a lack of understanding of consumers' motivations to perform a specific choice.

The second type of NPD also called consumer-led product development, which is focused on consumer's current and future needs being the market the determinant of the NPD. This second approach, a proactive one, supports that food markets have evolved from sellers markets to buyers markets and therefore, companies have to do a big effort to understand consumers' needs in order to develop products following upstream changes (Costa and Jongen, 2006).

Capitanio et al. (2009) argued that firms NPD process is built on a mix of product-driven and buyer-driven strategies, considering both R&D (know-how) and market-oriented activities essential for a successful NPD process. The same was argued by Sarkar and Costa (2008) and Gatignon et al. (2009) who state that the big amount of actors which participate in the food supply chain pressures firms to follow an open innovation strategy to succeed in their NPD process, highlighting the importance of customers as key actors but not exclusive in the NPD process.

Product diffusion literature (Talukdar et al. 2002), using the Bass diffusion model (BDM) noticed that the penetration potential of a new developed product depends on the ability of consumers to pay, their willingness to pay and the access to the product. Therefore, if consumers do not have access to the new product they will never adopt it and modify their purchasing decisions being this and input which influences suppliers for the development of new products. That is, consumers can only choose from the available options offered by retailers and manufacturers, putting such business in a powerful position to shape consumers choice (Revoredo-Giha, 2014).

3 The UK dairy market

The purpose of this section is to provide a short description of the structure and evolution of the dairy market in the UK, and in particular about the introduction of new products. About 50 per cent of the milk produced in the UK is sold liquid, 24 per cent is used to produce cheese and the remaining part is used to produce a number of products such as powder milk and yoghurt.

All dairy products except of those from the "free from" category have been suffering of a clear decrease on their sales during 2015 and 2016 relatively to 2014. The biggest reduction could be found in the "butter and spreadable" category. Fresh milk has also suffered an important decrease on sales especially on the own label category; in contrast, branded fresh milk show some modest increase. An opposite situation could be found in cheese where it is the branded category that has shown the greatest decrease (about 4 per cent).As reported in The Grocer (2016) the improvement for branded milk seems to be associated to the increasing focus to add value to the product. Yoghurt sales suffered a reduction in the period 2015 and 2016 compared to previous years; however this has been less significant than in other categories.

Table 1 presents the evolution of new dairy products from 2000 to 2014. The growth in the number of products per year has been 9.6 per cent. Although manufacturers have introduced more products than retailers, the latter have been growing much faster (23 versus 7 percent per year, respectively).

In terms of the claims, it is clear that new products have been introduced considering all the claims categories namely: convenience, demographic (i.e., destined to a particular group), health and nutrition, safety and sustainable. The data shows that in the later years there have been a significant development of products with claims associated to demographic and health and nutrition.

As regards the top companies introducing dairy products the top five are retailers, namely: Tesco, Sainsbury's, Marks & Spencer, Asda and Morrisons. Manufacturers can only be found in the 6th position (Müller Dairy).

4 Empirical work

4.1 Data

The analysis was based on an assembled database combining data extracted from Mintel Global New Products Database for United Kingdom (GNPD) and Kantar World Panel Dataset for Great Britain (KWDS). On the one hand, GNPD provides information about new products launched in selected countries around the world. For products launched in the UK market during 2011, the dataset contains information for 7,058 new products launched in different types of store retails by 1,507 manufacturing or retailing companies and considering 2,941 different brands. The products were classified into 26 categories. Dairy products represent 8.4 per cent of total launched products in UK for 2011 (588 dairy products).

In addition, the GNPD dataset also provides information about sub-categories, private label and origin among others. Of particular importance for this study was the fact that the dataset also provides information about the positioning claims in each product. This is important because they convey information to consumers about the product. A total of 74 different claims were found in the dataset. For the analysis these were classified into 5 groups namely: convenience (e.g., microwaveable), demographic (e.g., if destined to a particular demographic group), health and nutrition (e.g., low in calories), safety (e.g., no additives/preservatives) and sustainable (e.g. organic).

On the other hand, KWDS includes weekly records of all foods and beverages that were taken home from supermarkets and similar stores by GB households during the period 2013 to 2015. For each product, the dataset contains rich information on a number of attributes such as brand, manufacturer, origin of the product and whether the product is a private label, organic, gluten free, fair trade or animal-friendly product. The dataset also contains information on purchases.

The dairy products from GNPD were identified in KWDS and a categorical variable was created that took a value of 0 if the product failed (no purchases were found in KWDS), it took a value of 1 if sales were found but the product disappeared before 2015 and it took a value of 2 if the product was successful (sales were identified every year).

Table 2 presents the introduction of new dairy products classified by product category. It indicates a rate of success of 36.1 per cent. The table also shows an index of success where the average rate of success is 100. New products associated with evaporated milk, sweetened condensed milk, Margarine and other blends, rice/nut/grain and seed based drinks and non-flavoured milk (white milk) were the top successful categories. Table 3 presents the statistics for the variables that were considered for the econometric analysis.

4.2 Methods

The method used in the econometric analysis of the factors influencing the success of new food product developed for the UK dairy market during 2011 consisted of the use of the Multinomial Logit Model (MLM) (Green, 2012).

The MLM are employed to model relationships between a polytomous response variable (the success of the new developed product) and a set of repressor variables simultaneously fitting binary logits for all comparisons among outcomes (Scott and Freese, 2014).

As mentioned, the success of the new developed product introduced in UK dairy market in 2011 was assessed between three sales levels: still sold in the market in 2015 (success: 2), sold in the market from 2011 to 2014 but not in 2015 (intermediate success: 1) and never sold (failure: 0).

As stated by Scott and Freese (2014), the MLM can be written as

$$\ln \Omega_{m|b}(x) = \ln \frac{\Pr(y=m|x)}{\Pr(y=b|x)} = x\beta_{m|b} \text{ for } m = 1 \text{ to } J$$

Where b is the base outcome and the following J equations can be solved to compute the probabilities for each outcome as follows:

$$\Pr(y = m|x) = \frac{\exp(x\beta_{m|b})}{\sum_{j=1}^J \exp(x\beta_{j|b})}$$

$$\Pr(y = m|x) = \frac{\exp(x\beta_{m|1})}{\sum_{j=1}^J \exp(x\beta_{j|1})}$$

$$\Pr(y = m|x) = \frac{\exp(x\beta_{m|2})}{\sum_{j=1}^J \exp(x\beta_{j|2})}$$

5 Results and discussion

The purpose of this section is to understand the factors that influence on the success of the new developed product introduced in UK dairy market in 2011. This was addressed using the MLM model explained above. The final specification of the MLM model used is as follows:

Level of success of the new developed products = $\alpha_0 + \alpha_1$ new product + α_2 yoghurt + α_3 cheese + α_4 British product + α_6 type of claim₁ + α_7 type of claim₂ + ... + α_n interactions between product categories and claims₁ + ... + α_{n+k} interactions between product categories and claims_k

Table 5 presents the estimated results for the model and the marginal effects of the variables on the probability for the different levels of output. Goodness of fit results show that the likelihood ratio test indicates that the null hypothesis that the explanatory variables are not statistically significant is rejected, therefore it is possible to state that the model fits the data appropriately.

When considering the relevant factors that have an effect on the success of the new developed product, it is possible to observe that with regards to the type of launching, new products have less probability of success relatively to intermediate success than other type of launching (i.e. new formulation, new packaging, and new variety or relaunch). This can be explained because new products are factual innovations need to go through a process of acceptance or adoption by consumers whereas new formulation, new packaging, range extension or relaunch imply a lower level of innovation and can be easily accepted. This is because consumers buy new products

attracted by its observed attributes (colour, size, or other exterior characteristics) or credence attributes (based on trusted third-party assessment). However, after purchasing consumers balance the utility perceived from observed, credence and also experience attributes (such as taste, smell or other sensorial qualities). If the perceived utility lacks to fulfil consumers' expectations the new developed product will not be purchased in the long term. The more dramatic is the innovation more difficult can be the comparison between products by consumers.

When considering the different categories of dairy products, Table 5 shows that new introduced yoghurts have more chances to have an intermediate success than both to fail or have success compared to the other dairy categories. In the same way, new introduced cheese has less chances of success relative to intermediate success compared to other dairy categories. This means that when considering dairy products in aggregated categories new introduced yoghurts and cheese cannot be considered as dairy categories with long term approval by consumers.

Results also indicate that products with private label (introduced by supermarkets) are not significant when considering the probabilities of success compared to branded products. This variable has been removed from the final model due to its non-significance.

The variable British product (i.e., whether the product has a claim that identifies it a British) seems to be significant for both success and failure of the new introduced products compared to the intermediate success level. However, it seems to be positive for both degrees of success. Therefore, no statements can be done regarding to this attribute.

Regarding to the type of claim, results show that only three claims are significant. First, the one declaring that the products contains stanols, second the one that states that the products helps to reduce cholesterol and finally the claim that defines the products as "premium". Products announcing to have stanols or to be premium have more chances to have an intermediate success than to fail compared to those products without these claims. The claim low cholesterol seems to be significant and positive for both success and failure of the new introduced products compared to the intermediate success level. Consequently no conclusive results can be obtained for this last claim.

We also considered interactions between product categories and claims to better understand the probability of success for the dairy products. Table 5 shows first that the dairy product spoonable yogurt when is labelled as organic or gluten free has more chances succeed than to have an intermediate success compared to those spoonable yogurt commercialised without those claims. Next, we can observe that processed cheese with no additives/preservatives; hard and semi-hard cheese with convenient package; margarine with low fat and finally soft cheese deserts and white milk defined as vegetarian have more chances to have an intermediate success than to fail compared to those dairy products that doesn't have those claims. On the contrary, results point out that spoonable yogurt with no additives/preservatives have more probabilities to fail than to have intermediate success copared with spoonable yogurt without that claim. Finally, cream with seasonal claims, flavoured milk defined as vegetarian and spoonable yogur twith ethical - environmentally friendly package seems to be significant and negative for both success and failure of the new introduced products compared to the intermediate success level. Therefore, no statements can be done regarding to these interactions.

6 Conclusions

The purpose of this paper has been twofold: first to examine the rates of success of new developed dairy products for the UK market and second to identify some of the factors leading that success with special attention to the sustainable and health attributes.

We focused on products introduced in 2011 using Mintel's GNPD and their sales were identified up to 2015 using Kantar Worldpanel data. The results indicate an average rate of success of 36.1 per cent. The top successful categories were evaporated milk, sweetened condensed milk, margarine and other blends, rice/nut/grain and seed based drinks and non-flavoured milk (white milk).

MLM model results identify launched new products have less probability of being successful compared to other launched types (e.g., reformulations). When considering the different dairy categories it has been found that introducing yoghurt products or cheese decrease the probability of success. In addition, new products commercialised under a private label reveal non-significant results, being this attribute not relevant to be considered for the analysis.

The British origin of the product was not found not useful as to discriminate between success and failure as it increases the probability of success as well as the failure.

MLM model results also identify that all categories of claims named health, safety, environmental, demographic or convenient can be associated to the level of success of dairy products. However its significance is category specific.

7 References

- Capitanio, F., Coppola, A., and Pascucci, S, (2009) Indications for drivers of innovation in the food sector. *British food journal*, 111, 8, 820-838.
- Connor J., (1981) Food product proliferation: a market structure analysis. *American journal of agricultural economics*, 63, 4, 607-617
- Costa A.I.A. and Jongen, W.M.F. (2006) New insights into consumer-led food product development. *Trends in food science and technology*, 17, 457-465.
- Dijksterhuis, G. (2016) New product failure: Five potential sources discussed. *Trends in food science and technology*, in press, 1-6.
- Gatignon, J., Gotteland, D., Haon, C. (2016) *Making Innovation Last. Volume 2. Sustainable Strategies for Long Term Growth*. Ed. Palgrave Macmillan. London.
- Greene, W. H. 2012. *Econometric Analysis*. 7th ed. Upper Saddle River, NJ: Prentice Hall.
- Revoredó-Giha, C. (2014) Hitting the Jackpot and the Health Agenda: The Case of Processed Potato Products. *Procedia Economics and Finance*. Volume 14, 525–533.
- Rozenberg, S., Body, J.J., Bruyère, O. et al. (2016) Effects of Dairy Products Consumption on Health: Benefits and Beliefs—A Commentary from the Belgian Bone Club and the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases. *Calcification Tissue International*, 98: 1.

- Sarkar, S. and Costa, A.I.A (2008) Dynamics of open innovation in the food industry. Trends in food science and technology, 19, 574-580.
- Scott, J. and Freese, J., (2014) Regression Models for Categorical Dependent Variables Using Stata. Third Edition. Stata Press
- Stewart-Knox, B and Mitchell, P. (2003). What separates the winners from the losers in new food product development? Trends in food science and technology, 14, 58-64.
- Talukdar, D., Sudhir, K., Ainslie, A. (2002) Investigating new product diffusion across products and countries. Marketing Science, 21, 1, 97-114.
- The Grocer (2015) The grocer top product survey 2015. 19 December 2015. www.thegrocer.co.uk
- The Grocer (2016a) The dairymen, a supplement to the grocer. 17 September 2016. www.thegrocer.co.uk
- The Grocer (2016b) The grocer top product survey 2016. 17 December 2016. www.thegrocer.co.uk
- Zouaghi, F. and Sanchez, M. (2016) Has the global financial crisis had different effects on innovation performance in the agri-food sector by comparison to the rest of the economy? Trends in food science and technology, article in press.

Table 1 – UK Dairy sector – Introduction of new products figures 2000-2014

Categories	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Dairy	174	221	257	207	302	320	171	216	200	267	390	592	649	710	690
Branded	163	192	190	158	194	219	117	159	144	155	259	318	338	398	446
Private Label	11	29	67	49	108	101	54	57	56	112	131	274	311	312	244
Dairy products with at least one claim 1/															
Convenience	3	10	13	9	8	18	12	16	27	72	79	117	160	166	171
Demographic	51	101	127	96	158	145	64	75	101	173	293	433	501	568	538
Health and nutrition	47	100	114	78	112	130	70	75	85	118	202	309	318	330	332
Safety	25	22	32	21	22	45	18	33	42	57	109	159	178	198	195
Sustainable	31	40	26	13	22	18	17	30	29	45	131	205	213	260	274
Top 10 companies introducing dairy products															
Tesco	1	4	13	13	40	27	9	7	14	28	40	48	99	62	34
Sainsbury's	3	12	23	12	5	21	3	1	7	15	18	31	32	32	24
Marks & Spencer	1	3	13	12	17	22	15	17	10	9	17	12	32	24	24
Asda	4	1	3	2	5	7	3	1	2	11	22	40	38	36	36
Morrisons	0	0	0	0	1	7	1	1	0	5	11	36	46	68	35
Müller Dairy	4	7	10	11	19	13	7	6	6	6	10	15	13	23	38
Arla Foods	7	13	12	5	7	6	11	7	10	5	10	20	14	15	29
Dairy Crest	4	10	5	9	12	7	10	2	3	5	14	15	13	15	16
Waitrose	1	3	0	5	3	6	5	7	6	22	10	22	18	19	22
Nestlé	3	5	7	13	9	15	5	3	6	5	6	12	9	7	14
Others	146	163	171	125	184	189	102	164	136	156	232	341	335	409	418

Source: Own elaboration based on Mintel's GNPD

Note: 1/ Products may have more than one claim and they could be from different claim categories.

Table 2 - Degree of success by dairy product category

Categories	Fully failed	Partial success	Success	Total	Percentages				Success index
					Failed	Partial	Success	Total	
Evaporated Milk	0	1	4	5	0.0	20.0	80.0	100.0	2.22
Sweetened Condensed Milk	1	0	3	4	25.0	0.0	75.0	100.0	2.08
Margarine & Other Blends	6	2	17	25	24.0	8.0	68.0	100.0	1.89
Rice/Nut/Grain & Seed Based Drinks	1	0	2	3	33.3	0.0	66.7	100.0	1.85
White Milk	15	3	29	47	31.9	6.4	61.7	100.0	1.71
Soy Based Drinks	5	2	8	15	33.3	13.3	53.3	100.0	1.48
Cream	15	3	14	32	46.9	9.4	43.8	100.0	1.21
Butter	11	0	8	19	57.9	0.0	42.1	100.0	1.17
Fresh Cheese & Cream Cheese	8	3	7	18	44.4	16.7	38.9	100.0	1.08
Processed Cheese	9	4	7	20	45.0	20.0	35.0	100.0	0.97
Flavoured Milk	13	6	10	29	44.8	20.7	34.5	100.0	0.96
Shortening & Lard	3	1	2	6	50.0	16.7	33.3	100.0	0.92
Soft Cheese & Semi-Soft Cheese	29	7	17	53	54.7	13.2	32.1	100.0	0.89
Hard Cheese & Semi-Hard Cheese	61	19	35	115	53.0	16.5	30.4	100.0	0.84
Soy Yogurt	4	1	2	7	57.1	14.3	28.6	100.0	0.79
Curd & Quark	9	2	4	15	60.0	13.3	26.7	100.0	0.74
Soft Cheese Desserts	7	4	4	15	46.7	26.7	26.7	100.0	0.74
Drinking Yogurt & Liquid Cultured Milk	16	7	8	31	51.6	22.6	25.8	100.0	0.72
Spoonable Yogurt	76	19	31	126	60.3	15.1	24.6	100.0	0.68
Creamers	2	0	0	2	100.0	0.0	0.0	100.0	0.00
Liquid Dairy Other	1	0	0	1	100.0	0.0	0.0	100.0	0.00
Total	292	84	212	588	49.7	14.3	36.1	100.0	1.00

Source: Based on Mintel's GNPD and Kantar Worldpanel data.

Table 3 – Descriptive statistics

Variable	Obs	Mean	St. dev.	Min	Max
Dummy intermediate case	588	0.14	0.35	0.00	1.00
Dummy if success	588	0.36	0.48	0.00	1.00
Dummy if failed	588	0.50	0.50	0.00	1.00
Type of launch (dummies)					
New Formulation	588	0.04	0.19	0.00	1.00
New Packaging	588	0.22	0.42	0.00	1.00
New Product	588	0.41	0.49	0.00	1.00
New Variety/Range Extension	588	0.32	0.47	0.00	1.00
Relaunch	588	0.01	0.11	0.00	1.00
Product category (dummies)					
Evaporated Milk	588	0.01	0.09	0.00	1.00
Sweetened Condensed Milk	588	0.01	0.08	0.00	1.00
Margarine & Other Blends	588	0.04	0.20	0.00	1.00
Rice/Nut/Grain & Seed Based Drinks	588	0.01	0.07	0.00	1.00
White Milk	588	0.08	0.27	0.00	1.00
Soy Based Drinks	588	0.03	0.16	0.00	1.00
Cream	588	0.05	0.23	0.00	1.00
Butter	588	0.03	0.18	0.00	1.00
Fresh Cheese & Cream Cheese	588	0.03	0.17	0.00	1.00
Processed Cheese	588	0.03	0.18	0.00	1.00
Shortening & Lard	588	0.01	0.10	0.00	1.00
Flavoured Milk	588	0.05	0.22	0.00	1.00
Hard Cheese & Semi-Hard Cheese	588	0.20	0.40	0.00	1.00
Soy Yogurt	588	0.01	0.11	0.00	1.00
Curd & Quark	588	0.03	0.16	0.00	1.00
Soft Cheese Desserts	588	0.12	0.32	0.00	1.00
Drinking Yogurt & Liquid Cultured Milk	588	0.05	0.22	0.00	1.00
Spoonable Yogurt	588	0.21	0.41	0.00	1.00
Creamers	588	0.00	0.06	0.00	1.00
Liquid Dairy Other	588	0.00	0.04	0.00	1.00
Alternative product category					
Dairy non-milk products	588	0.16	0.37	0.00	1.00
Liquid milk	588	0.14	0.35	0.00	1.00
Cheese	588	0.26	0.44	0.00	1.00
Yoghurt (made of milk)	588	0.29	0.46	0.00	1.00
Fats	588	0.14	0.35	0.00	1.00
Dummy branded (0) and private label (1)	588	0.44	0.50	0.00	1.00
Dummy 1 if the product mentions that is a British product	588	0.10	0.29	0.00	1.00
Type of claim (dummies)					
Added Calcium	588	0.04	0.20	0.00	1.00
All Natural Product	588	0.02	0.14	0.00	1.00
Antioxidant	588	0.00	0.04	0.00	1.00
Babies & Toddlers (0-4)	588	0.00	0.06	0.00	1.00
Beauty Benefits	588	0.00	0.04	0.00	1.00
Bone Health	588	0.04	0.19	0.00	1.00
Carbon Neutral	588	0.01	0.10	0.00	1.00
Cardiovascular (Functional)	588	0.04	0.19	0.00	1.00

Variable	Obs	Mean	St. dev.	Min	Max
Children (5-12)	588	0.05	0.23	0.00	1.00
Cobranded	588	0.01	0.12	0.00	1.00
Convenient Packaging	588	0.07	0.25	0.00	1.00
Digestive (Functional)	588	0.04	0.19	0.00	1.00
Ease of Use	588	0.01	0.09	0.00	1.00
Economy	588	0.08	0.27	0.00	1.00
Ethical - Animal	588	0.02	0.12	0.00	1.00
Ethical - Charity	588	0.03	0.17	0.00	1.00
Ethical - Environmentally Friendly Package	588	0.28	0.45	0.00	1.00
Ethical - Environmentally Friendly Product	588	0.04	0.19	0.00	1.00
Ethical - Human	588	0.01	0.10	0.00	1.00
Gluten-Free	588	0.11	0.31	0.00	1.00
GMO-Free	588	0.04	0.20	0.00	1.00
High Protein	588	0.02	0.12	0.00	1.00
High/Added Fiber	588	0.00	0.06	0.00	1.00
Limited Edition	588	0.04	0.19	0.00	1.00
Low/No/Reduced Allergen	588	0.12	0.32	0.00	1.00
Low/No/Reduced Calorie	588	0.02	0.12	0.00	1.00
Low/No/Reduced Cholesterol	588	0.01	0.10	0.00	1.00
Low/No/Reduced Fat	588	0.35	0.48	0.00	1.00
Low/No/Reduced Glycemic	588	0.01	0.07	0.00	1.00
Low/No/Reduced Lactose	588	0.03	0.18	0.00	1.00
Low/No/Reduced Saturated Fat	588	0.05	0.22	0.00	1.00
Low/No/Reduced Sodium	588	0.02	0.12	0.00	1.00
Low/No/Reduced Sugar	588	0.03	0.17	0.00	1.00
Low/No/Reduced Transfat	588	0.04	0.20	0.00	1.00
Microwaveable	588	0.01	0.09	0.00	1.00
No Additives/Preservatives	588	0.24	0.43	0.00	1.00
No Animal Ingredients	588	0.04	0.20	0.00	1.00
On-the-Go	588	0.02	0.12	0.00	1.00
Organic	588	0.08	0.27	0.00	1.00
Other (Functional)	588	0.02	0.15	0.00	1.00
Prebiotic	588	0.00	0.06	0.00	1.00
Premium	588	0.05	0.21	0.00	1.00
Seasonal	588	0.03	0.17	0.00	1.00
Slimming	588	0.03	0.16	0.00	1.00
Stanols/Sterols	588	0.02	0.14	0.00	1.00
Time/Speed	588	0.01	0.07	0.00	1.00
Vegan	588	0.04	0.19	0.00	1.00
Vegetarian	588	0.69	0.46	0.00	1.00
Vitamin/Mineral Fortified	588	0.07	0.25	0.00	1.00
Wholegrain	588	0.01	0.08	0.00	1.00

Source: Own elaboration based on Mintel's GNPD.

Table 5 - Multinomial logit model of degree of success of new dairy products

	Product is successful				Product failed			
	Coeff.	St. Dev.	t ratio	Sig.	Coeff.	St. Dev.	t ratio	Sig.
Intercept	2.695	0.449	6.000	***	2.254	0.452	4.990	***
New Product	-0.792	0.282	-2.810	***	-0.022	0.264	-0.090	
Product is cheese	-1.563	0.501	-3.120	***	-0.763	0.492	-1.550	
Product is yoghurt (made of milk)	-2.021	0.544	-3.720	***	-0.923	0.517	-1.780	*
Dummy product mentions it is a British product	1.726	0.655	2.630	***	1.652	0.671	2.460	**
Dummy stanols	-1.361	0.872	-1.560		-1.396	0.741	-1.880	*
Dummy Premium	0.564	0.675	0.830		-1.187	0.741	-1.600	*
Dummy low cholesterol	13.170	1.215	10.840	***	15.124	0.995	15.210	***
Interactions								
Cream * Seasonal	-3.958	1.528	-2.590	***	-2.700	1.406	-1.920	**
Processed Cheese * No additives/Preservatives	-1.615	1.078	-1.500		-2.761	0.883	-3.130	***
Flavoured Milk * Vegetarian	-2.470	0.699	-3.530	***	-2.110	0.699	-3.020	***
Hard and Semi-hard Cheese* Convenient package	-0.449	0.542	-0.830		-1.231	0.569	-2.160	**
Soft Cheese Deserts* Vegetarian	-1.190	0.784	-1.520		-1.260	0.712	-1.770	*
Spoonable Yogurt * Ethical - Environmentally Friendly Package	-2.258	0.684	-3.300	***	-1.263	0.548	-2.300	**
Spoonable Yogurt * No additives/Preservatives	0.852	0.787	1.080		1.171	0.625	1.870	*
Spoonable Yogurt *Organic	2.193	1.144	1.920	**	0.859	1.111	0.770	
Spoonable Yogurt *Gluten free	1.408	0.870	1.620	*	0.887	0.802	1.110	
Margarine * Low fat	-0.987	0.906	-1.090		-2.128	1.027	-2.070	**
White milk * Vegetarian	-1.089	0.817	-1.330		-2.416	0.954	-2.530	**

Marginal effects of variables on the probability

New Product	0.121	-0.210
Product is cheese	0.081	-0.226
Product is yoghurt (made of milk)	0.088	-0.234
Dummy product mentions it is a British product	0.020	0.014
Dummy stanols	-0.004	-0.002
Dummy Premium	-0.034	0.044
Dummy low cholesterol	0.023	0.004
Cream * Seasonal	0.002	-0.010
Processed Cheese * No additives/Preservatives	-0.009	0.006
Flavoured Milk * Vegetarian	-0.004	-0.017
Hard and Semi-hard Cheese* Convenient package	-0.022	0.020
Soft Cheese Deserts* Vegetarian	-0.003	-0.002
Spoonable Yogurt * Ethical - Environmentally Friendly Package	0.020	-0.067
Spoonable Yogurt * No additives/Preservatives	0.018	-0.007
Spoonable Yogurt *Organic	-0.009	0.022
Spoonable Yogurt *Gluten free	-0.007	0.023
Margarine * Low fat	-0.015	0.012
White milk * Vegetarian	-0.024	0.018
Wald chi2 test	425.95 *	

Note: The base category is the intermediate case (i.e., product did not remain all the a years).

P<0.10* P<0.05** P<0.01***