Research article

Differences in retailer interfaces in assortment planning and communication strategies for homogenized baby food products

Stefano Massaglia, Valentina Maria Merlino*, Antonina Sparacino, Giulia Mastromonaco and Danielle Borra

Department of Agricultural, Forest and Food Sciences, University of Turin, Largo Paolo Braccini 2, 10095, Grugliasco, Italy

* Correspondence: Email: valentina.merlino@unito.it.

Abstract: This research analyzed the assortment size and depth, marketing characteristics, price policies and communication strategies in large-retail chains and online distributions for homogenized baby food. Comparisons of the assortment composition were made considering defined product categories based on the composition formula, specialty product, claims, product origin and packaging material. Prices differences were also assessed comparing the different retailer formats (supermarket, hypermarket, convenience store and discount). The main findings highlighted significant differences in the assortment planning decisions. In particular, direct sales seem to be more oriented towards providing a wide range of products together with more information on products healthiness and origin; online sales, on the other hand, focus its assortment planning decision on supplying products with high added value in composition and price: in fact, the extra communication of additional information regarding the product nutritional characteristics and certifications, as well as expert advice, characterized the majority of the explored websites. About the promotion, in the physical stores, more convenience packs have been used, while more discounts were applied directly to the online sale price. This research provides concrete tools to marketing managers to improve the planning and communication strategies of infant formula of homogenized products for a differentiated and successful sales policy. At the same time, producers can make a more informed and dynamic choice on the distribution chain that can best match the company's offer.

Keywords: assortment planning; homogenized baby food; large retail chain; marketing claims; marketing strategies; online sales; physical stores

1. Introduction

1.1. Background

The baby food industry is one of the fastest growing industries within the global market [1], in which the product, characterized by an increasingly high level of specialization, is characterized by a continuous dynamism in composition and innovation. In fact, the baby food sector is becoming increasingly important and has had to evolve in a short time in terms of implementing marketing strategies to address a growing market that interfaces with parental preferences and purchasing decisions. The increasing search for healthy and safe products, together with the guarantee of service and product convenience, has favored the growth of the baby food market, which seems to be characterized by a continuous evolution in terms of innovation and quality/safety certifications. In Italy, the baby food market is worth around 500 million euros, of which 400 million come from sales in large-scale retail stores (around 71%), followed by pharmacies (around 26%) and Para-pharmacies (around 3%). In terms of volumes, about 47 million kg of products were sold in 2021[2]. However, in response to a decrease in the birth rate in Italy (according to ISTAT data), there have been 30% fewer births in the last 10 years [3], companies have had to address the risk of losing the market through product innovation and new marketing strategies for multi-channel communication. On the innovation front, some companies have capitalized on the tendency to focus on the quality of the ingredients in the finished product. This is progressively strengthened by the consequent reformulation of baby food recipes to reflect consumers' change in preferences and eating habits. The latter were also affected by the Covid-19 pandemic, which also involved the baby food sector and its target market. In particular, the post-pandemic buyer seems to be more attracted to baby food products distinguishable by claims related to individual health and, in particular, regarding their positive effect on immune defenses [4,5]. In general, claims are statements that contain product information that could arouse an interest in the potential buyer and are often used in marketing strategies for product communication: this data is frequently reported on the product label and describes particular product features (linked to the origin, ingredients, nutritional or health properties, etc.) that must be truthful and based on scientific data. The claims used in food marketing strategies could be divided into two categories: nutritional and functional. The first ones represent information related to the presence or absence of some components within the product (such as fiber, protein, fat, sugar, etc.). Functional claims, on the other hand, are indications related to particular ingredients of the food product that offer health benefits that extend beyond their nutritional value. They can be further distinguished into generic functional (with active positive health effects) and functional products linked to a particular disease risk reduction [6]. A study conducted in the CLYMBOL project ("Role of health-related Claims and Symbols in consumer behavior") in 2016 found that 26% of food products sold in Europe displayed at least one nutritional or health claim. Nutritional claims were the most commonly used (21% of cases), followed by health claims (11%). Among the nutritional ones, those most used were those related to the presence of vitamins and minerals, followed by information related to fat content (e.g., "fat content less than...", "contains omega 3" etc.) (21%), those related to sugar (12%) and fiber content (9%).

Baby foods were among the products in which these claims were most frequently found [7,8]. Several studies conducted over the years have found that parents, who are deemed responsible purchasers for this product category, perceive baby food with nutritional or health claims on the label as more beneficial for their children [9]. This leads to their greater willingness to purchase products

that carry these claims on their front labels, particularly those related to properties beneficial to the immune system, the presence of calcium/vitamin D, and organic certification [9–11]. Adult preferences, in fact, become very impactful in the continued segmentation and sub-category growth development process of products destined to the post-weaning food phase. According to market analyses, the formulation of new baby products is centered on "natural", certified and unadulterated recipes: in 2019, claims "without additives" appeared on about two thirds of new products on the baby food market and the claim "organic certification" appeared on about half of the products [12]. In addition to attention towards raw material quality and properties, baby food consumers discriminate product choice from product origin [13]. In the Italian context, the influence of these new consumption trends has been acknowledged and concretized in a safety logo for baby food, presented by the Italian Ministry of Agricultural, Food and Forestry Policies (Mipaaf) [14].

It is a recognition mark that identifies a "private, voluntary, certified trademark with its own rules of use" to promote the Italian supply chain and which can be adopted by all baby food companies that certify it [15,16]. The goal is to promote the Italian origin of the product (very important for this category of purchasing managers) by transparently communicating the origin of the raw materials. This brand represents a sign of recognition of the baby food being Made in Italy [15,16]. The attention to raw materials, quality and origin is of the highest level for various leaders in the sector, in particular those that produce homogenized baby food products (Hp). Homogenized products must be steamed, packaged in glass containers with vacuum systems and, subsequently, sterilized [17]. This type of product is usually used in the children diet, in the weaning phase starting from 5-6 months. Homogenized products represent an important product category of the baby food sector, which is seeing an increase in the number of product lines according to different market needs [18]. In fact, the Hp segment is characterized by a high level of differentiation, added value in terms of convenience, safety and control of the ingredients used [19]. For example, considering the type of main ingredient, it is possible to distinguish homogenized product based on meat, fish, fruit, vegetables, yogurt, legumes, and cheese. The wide offer that characterizes them ranges from more traditional variants (such as veal, ham, chicken, etc.) to more innovative products such as horse meat and salmon. In recent years, even with regard to Hp, the range of products from organic farming has developed [20], that is, produced through natural methods, without the use of synthetic chemicals, preservatives, and colorants [5]. Several studies have shown that buyers of this product category are willing to pay a premium price for a certified organic product [21–23]. Concerning the Hp, there are different types of claims that can be found on the packaging: nutritional, health, ethical or regarding environmental and sustain-ability certifications [7]. As highlighted by a previous study, the most frequent claims in homogenized baby food products are those referring to health properties of the product such as "helps the immune system", "favorable to brain development", or related to the prevention of some disorders such as colic or intolerances [24,25].

Homogenized products are mainly sold within the points of sale of large-scale retail trade, especially in supermarkets and hypermarkets. The progressive expansion of the offer of this type of products has resulted in whole shelves being dedicated only to the sale of Hp [20]. Alongside the classic (physical) distribution channels, however, is developing also the online sales. The lockdown imposed with the spread of the Covid-19 pandemic has changed some buying habits: online purchases have increased and, in particular, the food world has seen a 55% growth in online sales compared to 2019 [26]. The baby food sector is also growing in the online channel: today's moms are increasingly looking for information that they can find online where brands are focusing on additional services (such as advice and consultations from experts) to add value to products. The presence of brands on

the web, both on dedicated e-commerce websites and on social channels dedicated to purchasing managers, has enabled manufacturers to develop dedicated marketing strategies as well as specific product lines that take into account the needs of consumers in the online market [5,27].

1.2. Definition of Research Aims

The baby food market is characterized by high competition considering the wide range of brands, product lines and types. Furthermore, the purchasers of these products are characterized by a higher level of attention and responsibility during the purchasing decision-making process. Labels, in this context, play an important role as they represent the sources of nutritional, health and origin-related product claims [28,29]. This research aimed to understand how the supply of these products is presented in two different sales channels, i.e., that of large-scale distribution and that of the online sites of the major national producers and private labels. In addition, the different communication strategies applied by these distribution channels were explored and compared. To this end, several variables that characterize the assortment of a product and related to the marketing mix elements, were considered and analyzed. Marketing claims were collected and divided into different categories (nutritional, health, related to certifications owned by the company, etc.) in order to specifically analyze what information tends to be communicated through the product packaging. The analysis regarded all the products supplied at different stores of large-scale retail distribution (LRd) located in North-West Italy and those commercialized by means of the websites of the leading producer brands and of some private labels. The considered geographical area of the North-West of Italy is the main sales area at an Italian level for baby food products with 32% of total national sales [30]. These objectives arose from the following considerations: (i) the large-scale retail trade is the main sales channel in Italy of Hp [20,31]; (ii) baby food products represent the main segment within baby food and the one most characterized by continuous product and process innovation; (iii) the distribution channel of online sales has recently become widespread. This research provides an analysis of the baby food market scenario, characterizing it in terms of breadth and depth of the assortment, price and positioning, as well as a description of the communication strategies used in the two sales channels considered. This analysis, therefore, provides concrete tools to understand what is currently on the market, towards which new products manufacturers are directing their choices, and which communication and offer planning strategies differentiated by sales channels are being implemented to meet the needs of the different consumer targets [5,30]. In the literature, there is a considerable number of studies concerning the purchase preferences of baby food, the strategies applied by brands to promote products on their online sites, and how additional information on the label represents purchase drivers [5,9–11,18,27]. However, to our knowledge, this research contributes to enriching the scientific literature devoted to research on supply planning and marketing communication policies applied in two different distribution channels considering Hp products.

2. Materials and methods

2.1. Data collection and data analysis

In this research, information of all the number of product variants/references or stocked units (SKUs) of baby food products (including infant milk, homogenized products - Hp, pasta and biscuits)

stored at physical points of sale of LRd and on online websites was collected between October 2020 and February 2021. In particular, we focused only on the analysis of data related to Hp. First, the online supply was analyzed considering 14 websites of the main baby food producer brands: 4 belonging to private labels and 10 to international brands. The information collected for each product referred to each variable of the marketing mix elements (product, price, promotion and place) [32,33]. About the product, we have collected information on the product type (considering the type of main ingredient among meat, fish, fruit, vegetables, cheese, legumes and yogurt), the certifications (lactose-free, organic, without milk and derivates), the packaging (format and materials) and the indication of origin. We collected the price of the product and the presence of offer. About the place, we recorded the type of retail formats (in the case of physical surveys), while for the promotion we registered all the claims on the labels. After the analysis of the online shops, a checklist containing all the products' characteristics found on the market was created. The latter was then subsequently used in the physical stores of the distribution chains for the collection of data regarding all the SKUs available on the shelves. Surveys in physical stores were conducted also considering different formats (hypermarkets, supermarkets, convenience stores, and discount stores) for a total of 20 stores located in North-West Italy. In particular, for hypermarkets (stores with a surface area greater than 2500 m^2), 2 different retail formats were considered for a total of 4 stores. Supermarkets are larger than 400 m^2 and, in this research, 6 different retailers were considered for a total of 11 stores. The convenience stores have a smaller format size (200–400 m^2) and 3 of them were considered with two different retailers. In this research, products were also registered in 2 hard discount stores (surface of 200–1000 m^2).

All the references analyzed in the data collection phase were categorized following the grouping criteria described in Table 1 and examined to determine the assortment size (A_{size}), which represents the number of product categories/lines in a portfolio, and depth (A_{depth}), i.e. the number of references within a product category [34,35].

At this step, for each product category, the A_{depth} of the various subcategories was compared considering the two distribution channels, direct and online [35]. The significant differences among the Hp A_{depth} values, defined for each product sub-categories [36], were tested using the non-parametric statistic Chi-square test, following a variance homogeneity test for the quantitative analysis. The Chi-square test it's useful to understand if the difference above two groups are statistically significant, it is an appropriate test when the data are in the form of frequency counts occurring in two or more mutually exclusive categories [37]. In the case of the analysis of marketing claims, a further exploration was carried out by examining the A_{depth} for each claim (found on the product label) belonging to 5 sub-categories in order to evaluate the difference in communication strategies used in the two considered distribution channels (Figure 1). In addition, the association between the 5 sub-categories of claims and the product sub-categories (Table 1), a series of Correspondence Analyses (CA) were conducted by analyzing [claims categories x Product type], [claims categories x Specialty product] and [claims categories x product origin], including also the distribution channel as variable. The packaging material was excluded from the analysis as almost all the references detected were packaged in glass jars. The Correspondence Analysis is widely used in scientific research to identify the associations between variables and simultaneously to organise them graphically in the same dimensional space [38,39] Starting from a contingency table, the CA allows to represent data in the same geometric space, constructing the data representation by the chi-square. This methodology also allows variables to be represented on the basis of the principal components (axes) identified [40]. In the biplot, the proximity between the points represents a higher association between the various levels of rows and columns. In

addition, based on the different associations of multinomial variables, in the CA results interpretation, the number of prevalent dimensions are determined, considering valid only those with a singular value greater than 0.20 [39–41].

In the case of price (continuous variable), the differences of the mean, maximum and minimum values (calculated for each sub-categories) were evaluated using the non-parametric Kruskal-Wallis test [42,43], comparing the LRs and online distribution channels. This kind of test is one of the most used when there is equal symmetry of the distribution of samples, and the variance is homogeneous. To verify the normal distribution of prices, Shapirowilk's statistic test was first applied, which showed a price trend curve that deviates from normality [44,45]. All of the statistical analysis was performed using IBM SPSS Statistics v.28. This methodological approach applied for the analysis of the product supply, albeit based on simple and non-parametric statistical tests, associated with the Correspondence Analysis, allows defining statistically differences in terms of depth and size of the assortment between two populations (online and offline sales), as well as the marketing claims and price policies, following the scheme already applied in a previous works on cow's milk assortment planning characterization [33,39].

Table 1. Product grouping criteria, product categories and sub-categories.

| Grouping criterion	Product category	Product sub-categories
Type (variety) of product (main ingredient)	Product type	Only meat, meat and vegetables/meat and cereals
		Fish and vegetables/fish and cereals
		Only vegetables
		Only cheese
		Only legumes
		Fruits
Certification	Specialty product	Organic
		Lactose-free
		Milk (or derivates)-free
Presence and type of claims	Claims	Health properties
		Micro-macro nutrients (nutritional claims)
		«Naturalness» communication
		Sensory characteristics
		Certification
Indication of origin	Product origin	Raw material
		Final product
		«Italian recipe»
Packaging material (type)	Packaging material	Plastic
		Glass
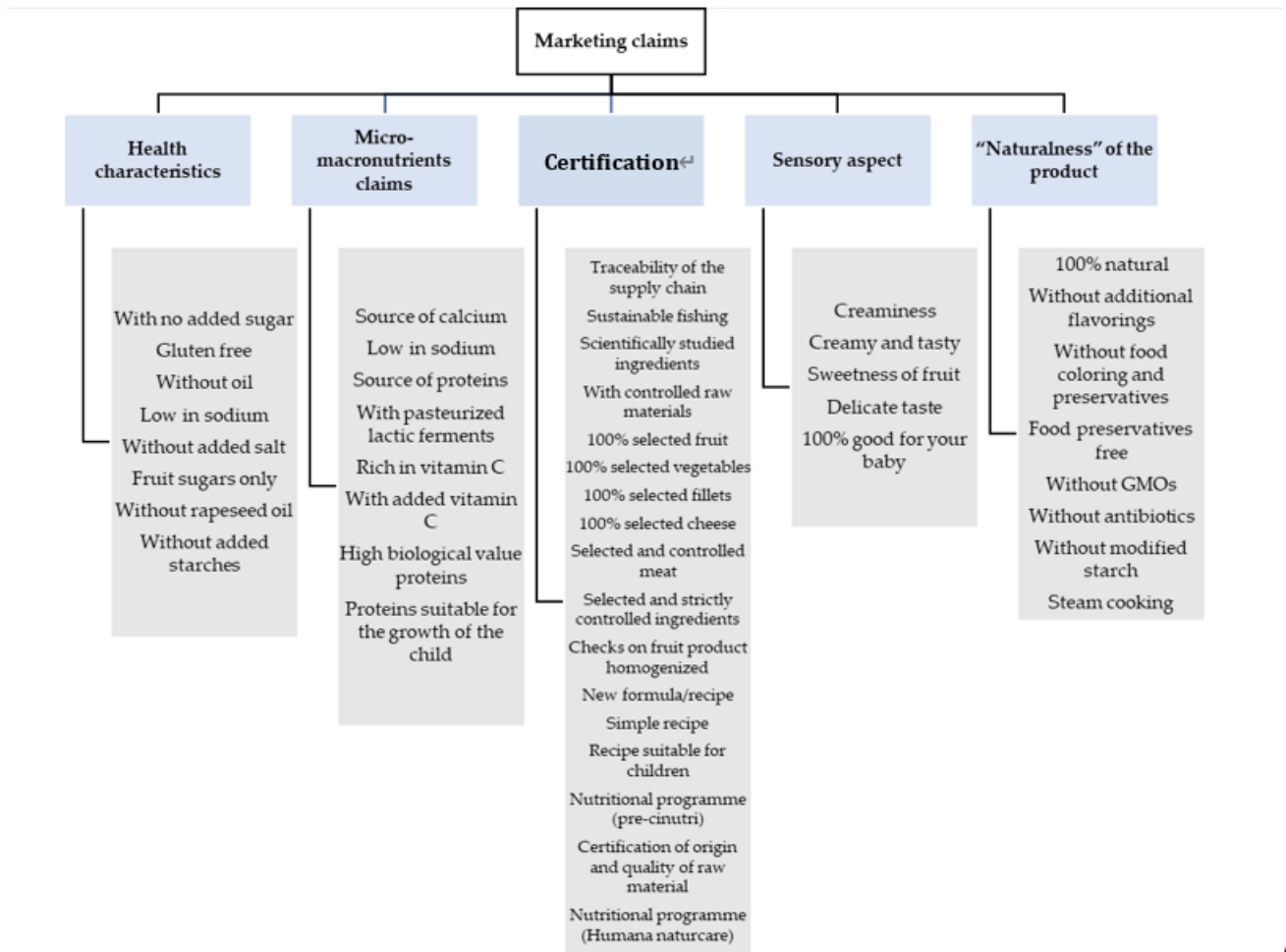
Figure 1. Single claim belonging to each claim sub-category collected on homogenized baby food product (Hp) labels at direct and online sales distribution channels.

3. Results

3.1. Assortment size and depth

The total portfolio of Hp considered in this study consists of 1642 references, 1337 recorded in physical stores and 305 in the online shops. From the A_{size} analysis, it emerges that Hp represents about 55% of the total number of references of the baby food portfolio (including infant milk, pasta and biscuits) collected during data recording.

In the Hp line, from the A_{depth} analysis considering firstly the product type category, it emerged that the most used ingredients for the homogenized product formula is meat (only meat or mixed with vegetable and cereals), both in large-scale retail stores and in online sales (Table 2). This was followed by homogenized fruits with a frequency of 36% in both types of distribution channels. The rest of the subcategories presented much lower percentages: 10% fish-based and 4% cheese-based for both sales channels. The percentage of homogenized vegetable products was higher on the websites of the major manufacturers than that found in physical stores. Legume-based homogenizers also represent a "niche" type compared to the two most commonly found subcategories (Table 2).

Table 2. Difference of the number of references (A_{depth}) for each product type sub-category comparing the online and the direct distribution channels.

Product sub-categories	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
Only meat	211 (16%)	59 (19%)	270	2.311	*
Meat and vegetables/meat and cereals	295 (16%)	57 (19%)	352	1.665	*
Fish and vegetables/cereals	136 (10%)	27 (9%)	163	0.478	**
Only vegetables	94 (7%)	27 (9%)	121	1.215	
Only cheese	56 (4%)	13 (4%)	69	0.040	
Only legumes	56 (4%)	12 (4%)	68	0.039	
Fruits	489 (37%)	110 (36%)	599	0.250	*
Total	1337	305	1642		

The p-value refers to the statistical significance levels ** < 0.01, * < 0.05. No values indicate a no significance level.

From the A_{size} results it emerged that 35% of the total homogenized product portfolio was composed by certified products (specialty), of which most were organic products (Table 3).

Table 3. Difference of the number of references (A_{depth}) for each product type sub-category comparing the online and the direct distribution channels.

Specialty product sub-categories	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
Organic	387 (98%)	166 (90%)	553	0.221	***
Lactose-free	4 (1%)	14 (8%)	18	0.163	***
Without milk (and derivates)	4 (1%)	5 (3%)	9	0.072	**
Total	395	185	560		

The p-value refers to the statistical significance level: *** < 0.001, ** < 0.01. No values indicate a no significance level.

3.2. Packaging materials

Generally, the Hp analyzed were sold in jars of 80 or 100 g, each wrapped in packs of 2, both in physical stores and online. The results about the differences in A_{depth} considering the sub-category related to packaging material (glass and plastic) showed how the two different sales channels adopted the same policy regarding the choice of glass for the homogenized products packaging material. In fact, 99% (n = 1323) and 98% (n = 299) of the references commercialized by direct sale and online distribution, respectively, were packaged in glass jars. In addition, in the physical points of sale of large-scale distribution, 20% of the assortment was found to be available in convenience formats (6 or 9 jars). In contrast, this feature was not found on manufacturers' websites, where, on the other hand, 14% of products subject to discounts of between 11 and 65% appeared.

3.3. Marketing claims analysis

From the results shown in Table 4, it can be seen that the sub-category of claims most used in communication strategies for Hp was that referring to beneficial effects on health, followed by those

advertising the product's higher quality and naturalness, both for products sold in physical points of sale and those sold online. Significant differences considering the A_{depth} for each considered claim category was found comparing the two distribution channels (directly and online).

Table 4. Differences of the number of references (A_{depth}) for each claim sub-category comparing the online and the direct distribution channels.

Product sub-categories	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
Health characteristics claims	1773 (32%)	409 (37%)	2182	1.352	**
Micro-macronutrients claims	584 (11%)	63 (6%)	647	0.125	*
Higher quality claims	1526 (28%)	281 (25%)	1807	1.148	***
"Naturalness" of the product	1230 (22%)	252 (23%)	1482	1.253	*
Sensory aspect claims	355 (6%)	106 (10%)	461	0.099	*
Total	5468	1111	6579		

The p-value refers to the statistical significance level: *** < 0.001, ** < 0.01, * < 0.05. No values indicate a no significance level.

In Table 5 the results about the differences in A_{depth} considering the sub-category "health characteristics claims" comparing the two types of sales channels highlight the evidence of "without added salt" in both distribution categories with a similar percentage, followed by "gluten free". The comparison between direct and online sales for the statements "with no added sugar", "gluten free", "without added starches" and "fruit sugars only" highlighted a significant difference in A_{depth} (Table 5).

Table 5. Differences in A_{depth} for each sub-category in the "Health characteristics" claims group comparing the online and the direct distribution channels.

Health characteristics claims	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
With no added sugar	61 (3%)	38 (9%)	99	0.135	***
Gluten free	356 (20%)	143 (35%)	499	0.176	***
Without oil	57 (3%)	8 (2%)	65	0.029	
Low in sodium	10 (0.8%)	2 (0.7%)	12	0.003	
Without added salt	673 (38%)	145 (35%)	818	0.009	
Fruit sugars only	316 (18%)	44 (11%)	360	0.077	**
Without rapeseed oil	3 (0.2%)	1 (0.3%)	4	0.009	
Without added starches	297 (17%)	28 (7%)	325	0.119	***
Total	1773	409	2182		

The p-value refers to the statistical significance level: ***<0.001, **<0.01. No values indicate a no significance level.

The most used claims related to micro and macro nutrients, in both distribution channels considered, were those related to the biological value of proteins and to the addition of vitamins. However, significant differences for the latter sub-categories are evident when comparing the distribution channels (Table 6).

Table 6. Differences in A$_{depth}$ for each sub-category in the "Micro-macro nutrients" claims group comparing the online and the direct distribution channels.

Micro-macronutrients claims	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
Source of calcium	44 (8%)	7 (11%)	51	0.019	
Low in sodium	10 (2%)	2 (3%)	12	0.003	
Source of proteins	26 (4%)	3 (5%)	29	0.026	
With pasteurized lactic ferments	46 (8%)	2 (3%)	48	0.045	*
Rich in vitamin C	136 (23%)	11 (17%)	147	0.084	**
With added vitamin C	133 (23%)	17 (27%)	150	0.053	*
High biological value proteins	185 (32%)	16 (25%)	201	0.097	***
Proteins suitable for the growth of the child	4 (1%)	5 (8%)	9	0.073	**
Total	584	63	647		

The p-value refers to the statistical significance level: *** < 0.001, ** < 0.01, * < 0.05. No values indicate a no significance level.

In case of the advertisings belonging to the group of "Higher quality claims", significant differences between the policies chosen by the two distribution channels emerged: in case of the direct sales channel, the most present claims were "Certification of origin and quality of raw material" and "Nutritional program". By contrast, the online distribution focuses attention on the controlled selection of raw material, especially promoting "100% selected fruit" and "Certification of origin and quality of raw material" (Table 7).

Table 7. Differences in Adepth for each sub-category in the "Higher quality" claims group comparing the online and the direct distribution channels.

Higher quality claims	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
Traceability of the supply chain	47 (3%)	6 (2%)	53	0.031	
Sustainable fishing	5 (0.3%)	7 (2%)	12	0.090	***
Scientifically studied ingredients	16 (1%)	8 (3%)	24	0.049	*
With controlled raw materials	45 (3%)	26 (9%)	71	0.104	***
100% selected fruit	33 (2%)	16 (6%)	234	0.068	**
100% selected vegetables	0 (0%)	3 (1%)	3	0.091	***
100% selected fillets	4 (0.3%)	3 (1%)	7	0.043	
100% selected cheese	0 (0%)	1 (0%)	1	0.053	*
Selected and controlled meat	234 (15%)	38 (14%)	272	0.047	
Selected and strictly controlled ingredients	59 (4%)	14 (5%)	73	0.006	
Checks on fruit product homogenized	136 (9%)	11 (4%)	147	0.084	*
New formula/recipe	0 (0%)	9 (3%)	9	0.159	***
Simple recipe	0 (0%)	1 (0%)	1	0.053	*
Recipe suitable for children	96 (6%)	39 (14%)	135	0.086	***
Nutritional program	386 (25%)	41 (15%)	427	0.129	***
Certification of origin and quality of raw material	465 (30%)	49 (17%)	514	0.148	***
Nutritional program	0 (0%)	9 (3%)	9	0.159	***
Total	1526	281	1992		

The p-value refers to the statistical significance level: *** < 0.001, ** < 0.01, * < 0.05. No values indicate a no significance level.

The promotion of the "naturalness" of the product occurred using several claims and, in particular, using the statement "100% natural" both in direct sales and online. Moreover, also seeing the other claims in this category, significant differences in A_{depth} emerge when comparing the two considered distribution channels (Table 8).

Table 8. Differences in A_{depth} for each sub-category in the "Higher quality" claims group comparing the online and the direct distribution channels.

"Naturalness" of the product	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
100% natural	747 (69%)	70 (31%)	817	0.238	***
Without flavorings	138 (13%)	50 (22%)	188	0.082	**
Without food coloring and preservatives	117 (11%)	64 (28%)	181	0.158	***
Food preservatives free	0 (0%)	1 (0%)	1	0.053	*
Without GMOs	2 (0%)	12 (5%)	14	0.164	***
Without antibiotics	2 (0%)	3 (1%)	5	0.061	*
Without modified starch	0 (0%)	12 (5%)	12	0.183	***
Steam cooking	72 (7%)	14 (6%)	86	0.009	
Total	1078	226	1304		

The p-value refers to the statistical significance level: *** < 0.001, ** < 0.01, * < 0.05. No values indicate a no significance level.

Claims referring to the sensory aspect of the product were also found in 22% of the products sold at LRd and in 8% of the assortment in the selected online stores. The most frequent claim in large-scale retail was "sweetness of fruit", while online it was "100% good for your baby". The claim "creamy and tasty" was present only on products registered on websites (Table 9).

Table 9. Differences in A_{depth} for each sub-category in the "Sensory aspect" claims group comparing the online and the direct distribution channels.

Sensory aspect claims	Distribution channel			X-squared	p-value
	LRd	Shop online	Total		
Creaminess	63 (18%)	23 (22%)	86	0.054	*
Creamy and tasty	0 (0%)	9 (8%)	9	0.159	***
Sweetness of fruit	165 (46%)	23 (22%)	188	0.052	*
Delicate taste	31 (9%)	12 (11%)	43	0.041	
100% good for your baby	96 (27%)	39 (37%)	135	0.086	***
Total	355	106	461		

The p-value refers to the statistical significance level: *** < 0.001, ** < 0.01, * < 0.05. No values indicate a no significance level.

3.4. The communication of the origin in homogenized baby food products

In this research, the communication strategies of product origin as claims on the label were analyzed. This indication was divided into 3 subcategories: national origin of the product, national origin of the raw material and "Italian recipe". The communication of the national origin of both the product and raw material was substantial in the LRd, while the majority of claims related to the national

origin of the raw material was found in the online shops. In proportion, the promotion of "Italian recipe" prevailed in the online distribution (Table 10).

Table 10. Differences in A_{depth} for each sub-category in the "Origin indication" claims group comparing the online and the direct distribution channels.

Claims about the origin	Distribution channel		X-squared	p-value
	LRd	Shop online		
Product origin (national)	516 (39%)	52 (18%)	0.170	***
Raw material origin (national)	514 (39%)	78 (27%)	0.097	***
"Italian recipe"	96 (7%)	39 (13%)	0.084	**

The p-value refers to the statistical significance level: *** < 0.001, ** < 0.01. No values indicate a no significance level.

3.5. Claims communication in function of product categories and distribution channel

The Correspondence analysis results of the "claims categoriess x product type_distribution channel" variables combination are described in Figure 2, while the dimensional solution is reported in Table 11. In this case, considering as significant the dimensions with singular values greater than 0.20, two principal dimensions (axes) were considered as valid which account for 87% of the total variance.

Table 11. Correspondence analysis (claims categoriess x product type_distribution channel): eigenvalues and determination of appropriate dimensions. The chi-square of independence between the two variables (columns and rows) and the p-value are also reported. The accepted dimensions are in bold.

Dimensions	Singular value	Inertia	Proportion explained %	Cumulative proportion %	X-Squared	p-value
1	0.397	0.157	0.609	0.609	1032.660	***
2	0.260	0.067	0.261	0.869		
3	0.180	0.032	0.125	0.994		
4	0.038	0.001	0.006	1.000		
Total		0.259	1.000	1.000		

The p-value refers to the statistical significance level: *** < 0.001.

As can be seen from Figure 2, different relationship patterns between product type, sales channels and claims categories emerged. Firstly, there is a high association between sensory aspects (claims) and fruit/vegetable-based products, both at direct and online sales channels. At the same time, the relationship between the naturalness and health claims with fruits/vegetables/legumes-based products at direct sales resulted clear. Also in this case, the communication of micro and macro nutrients is majorly associated with product sold online (especially meat-based). Finally, the communication of claims about product certification appears to be associated with fish and vegetable products sold both online and at direct sale, with legume/vegetable-based product sold online and with cheese-based product sold at direct sales channel.
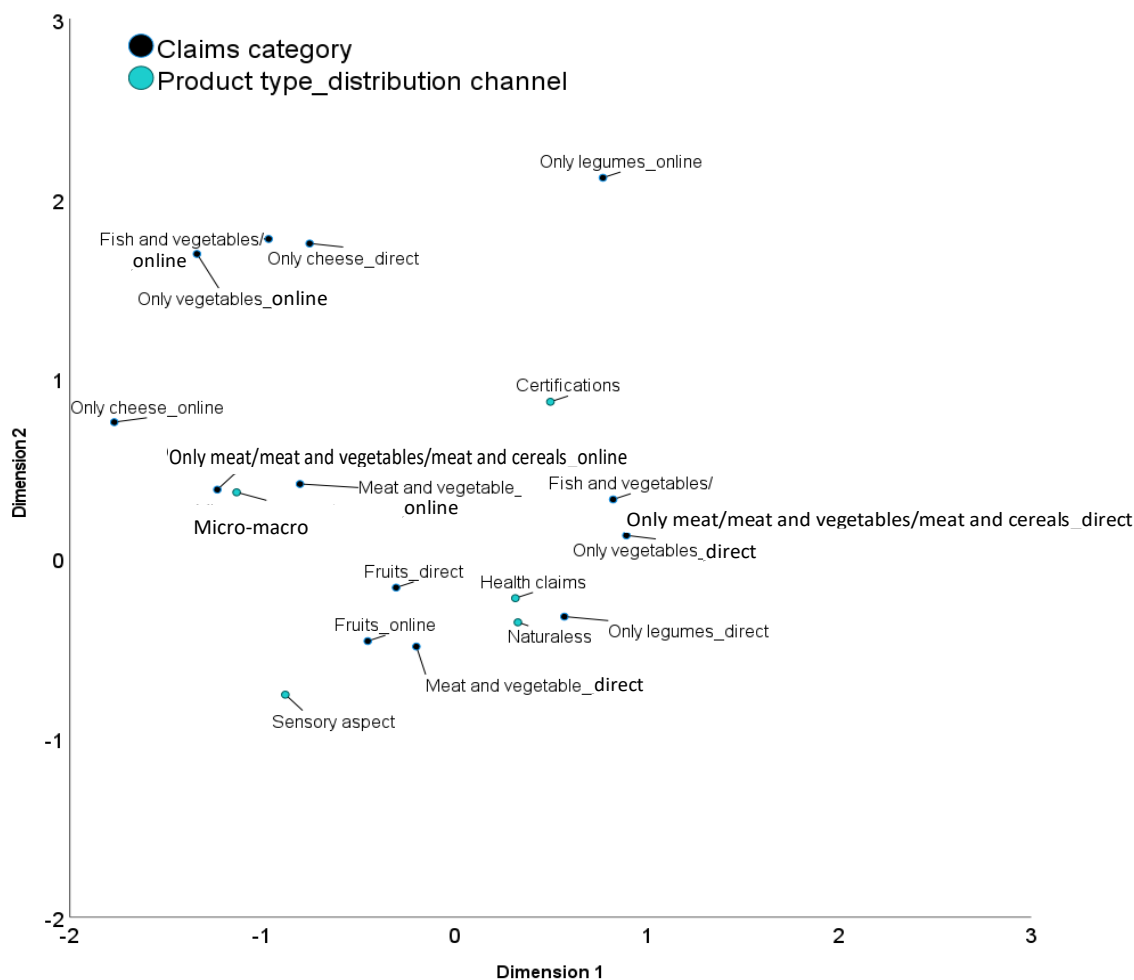
Figure 2. Correspondence Analysis (claims category x product type_distribution channel).

Table 12. Correspondence analysis (claims category x certification_distribution channel): eigenvalues and determination of appropriate dimensions. The chi-square of independence between the two variables (columns and rows) and the p-value are also reported. The accepted dimensions are in bold.

Dimensions	Singular value	Inertia	Proportion explained %	Cumulative proportion %	X-Squared	p-value
1	0.631	0.398	0.527	0.527	15.855	*
2	0.487	0.237	0.314	0.841		
3	0.347	0.120	0.159	1.000		
Total		0.755	1.000	1.000		

The p-value refers to the statistical significance level: * < 0.05.

From analysing the correspondence between "claims category x certification_distribution channel" a three-dimensions solution emerged as significant, accounting for 100% the total variance (Table 12).

Figure 3 shows the net grouping of micro-macro nutrients claim category and the product "without milk" sold online. At the same time, the naturalness and the certification claims categories of products appear to be associated especially with the organic product sold at the online stores. Finally,

the certified product sold at direct store, both lactose-free, organic and without milk, were majorly associated with sensory and health claims.
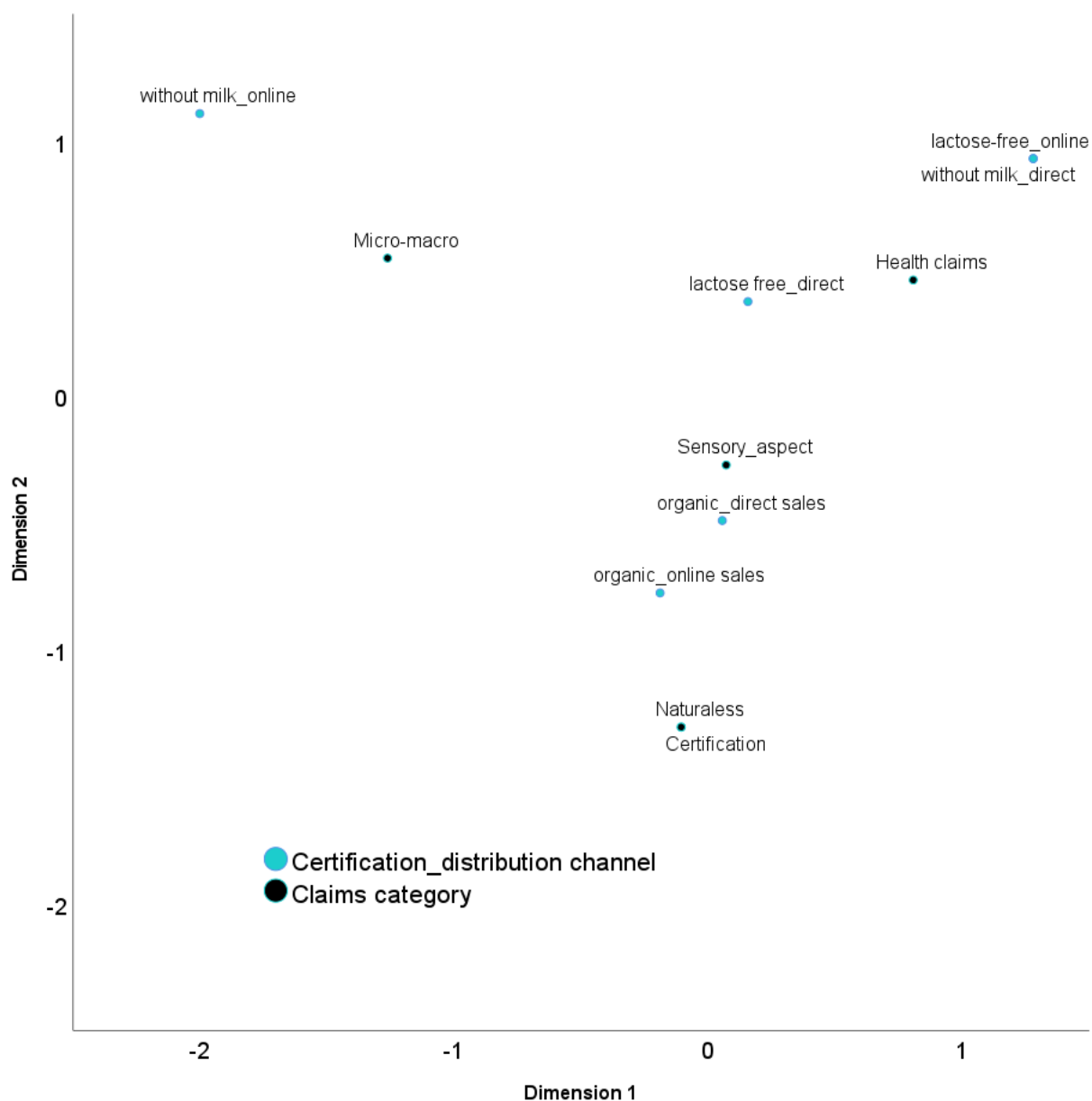

Figure 3. Correspondence Analysis (claims category x certification_distribution channel).

The CA for the association of the following variables "claims category x origin indication_distribution channel" was not significant, considering the limits of the singular values, which must be greater than 0.20. In Table 13, the multi-way contingency table used in CA "claims category x origin indication_distribution channel" are reported.

Table 13. Multi-way contingency table used in CA "claims category x origin indication_distribution channel".

Distribution channel	Product origin indication	Claims category					X-squared	p-value
		Health claims	Sensory aspect	Micro-macro nutrients	Naturaless	Certification		
Direct sale	Final product	456	0	212	442	516	0.425	> 0.05
Direct sale	Raw material	440	0	185	385	470		
Online	Final product	11	11	64	0	70		
Online	Raw material	0	5	46	0	45		

3.6. Price analysis

In general, the mean price (€/kg) calculated considering the homogenized products collected in the direct sales and online channels differed by 3 cents (Table 11) comparing the two distribution channels (Table 14). In case of LRd, we found the maximum and minimum prices higher that those registered in the online assortment.

Table 14. The mean, minimum and maximum prices (€/kg) for homogenized products collected at LRd (n=1337) and online stores (n=305).

Price (€/kg)	Distribution channel	
	LRd	Shop online
Mean	9.13	9.16
Min.	2.25	1.39
Max.	20.63	18.13

Focusing on Hp distributed by LRd, the comparison of product mean prices considering the different formats is reported in Table 15. As far as homogenized products are concerned, on the other hand, these were present in all types of distribution chains. The convenience store was the format in which the highest average price was recorded, while in the supermarket the product with the lowest price and the product with the highest price were found.

Table 15. Difference of mean prices (€/kg) recorded for homogenized baby food products in the different LRd formats.

LRd formats	A_{depth}	Mean price (€/kg)	Mean range	H Kruskal-Wallis	p-value
Supermarket	703 (53%)	8.66	617.57	35.065	***
Hypermarket	442 (33%)	9.46	690.90		
Convenience store	160 (12%)	10.43	808.06		
Discount	32 (2%)	8.55	626.13		
Total	1337				

The p-value refers to the statistical significance level: *** < 0.001.

4. Discussion

This research analyzed the supply of homogenized baby food products comparing their marketing characteristics (about product, promotion, price and positioning) in two different distribution channels: direct sales in large-scale retail chains and online sales on the websites of the major baby food producers in an Italian context. Thus, it was possible to characterize and compare the marketing policies applied by the two different distribution channels. Starting from a more complete study that collected information on the entire assortment of baby food products (cookies, pasta, milk), the line of products dedicated to homogenized products, both in the large-scale retail trade and in online stores, represents the most assorted and penetrating one. In fact, as shown also in other studies [19,46], homogenized products occupied the higher percentage of the total baby food products assortment. The composition of the baby food market responds to the needs of the demand represented by an increasing number of working mothers who have strongly influenced the demand for ready-made jars of homogenized baby food [47,48]. The possibility of finding ready-made, healthy and differentiated food to satisfy a complete and varied diet, certainly represented key elements to favor the development of the Hp market segment which, compared to homemade baby food, have the right features to maintain modern lifestyles, save time, and are guaranteed by historic and established brands on the market.

Currently, online sales have been a great resource for companies. With the crisis of the markets due to the restrictions imposed by the Italian government to deal with the COVID-19 pandemic, companies have been able to both maintain sales and also exploit the tool of online sales to increase the level of loyalty, service and custom care. As described in [49], an analysis of a case study has shown how companies can exploit the Internet to provide dedicated customer relationship management services, as well as develop more widespread communication strategies, compared to the tools available in direct store sales, through, for example, information campaigns on child nutrition, recipes, and product ingredients.

In this regard, the products registered online generally presented more information on the label: brands can decide what and how much information to provide to the consumer by managing their own website [50]. From this research, it emerged that the producers analyzed through their websites follow the preferences of mothers (or purchasing managers) towards communication strategies based on a lot of added information, both nutritional, related to certifications and natural characteristics of the product [11,24]. Thus, even the baby product sector is experiencing progressive growth in the online channel, aided by two of the attributes most considered during purchases by decision-makers: brand loyalty and the amount of product information provided. In fact, in addition to creating an online shop for sales, brands aim to provide information on their site related to the product, their brand and free sections to request consultations with specialists [5,27,29]. In our work, from the comparison of the A_{size} and A_{depth} between the online and LRd stores, was found that the portfolio composition of baby food products was in line with what is reported in the literature, according to which large-scale distribution concentrates the majority of the supply of baby food [20]. Generally speaking, the two distribution channels showed some common strategies, such as variety of product assortment, and others that differ, such as claim communication strategies and promotions.

In both physical and online stores there were many product varieties depending on the type of ingredient mainly contained (product type category) (meat, fish, fruits, vegetables, etc.). Both types of distribution, therefore, adopt a product assortment policy that follows the needs of purchasing

managers. The high number of available varieties increases the willingness to buy the product; in fact, the wide selection influences purchasing behavior [20,51,52]. The high variety of products, from meat, vegetables, legumes and fruit, coincides with the needs of mothers who can count on these products to satisfy a varied and complete dietary plan for their children, while at the same time enjoying the high level of convenience offered by this type of product.

As regards specialty products ("organic", "lactose-free" and "without milk and derivatives"), they accounted for 35% of the homogenized products on offer, a share in line with the composition of other products now mainly intended for infant feeding [53], such as cow's milk, whose assortment in the large-scale retail trade explored in the same area as our research, was characterized by a 45 % share of specialty products [33]. In particular, a common orientation in promoting organic certified product was followed by both the distribution channels; the predominant presence of organic products in both distribution channels confirms the growing trend of organic food sales in recent years in the different distribution channels [54,55]. Instead, "lactose-free" products were practically absent in the large-scale retail supply and present in a very small percentage in the online offer, despite the increase in cases of lactose and lactose-derived intolerances among children [56–58]. Therefore, manufacturers could improve this marketing aspect of communication, especially for Hp products derived from raw materials such as meat and fruit, to accommodate all the needs of this market sector.

In general, given the importance of parents' choices about baby food − because the latter directly determine what infants eat − the decision-making process related to this food could be attributable not only to a growing sense of responsibility on behalf of consumers towards the social and environmental conditions of the planet, but above all to the controlled and certified safety and wholesomeness of the product itself. The organic certification was often used for the communication of product safety, health and sustainability, also in case of baby food products [59]. In fact, even in our research, among the most common claims there was precisely that of the naturalness of the product, referring to the choice of natural products, without the addition of secondary products. However, the presence of this claim on the label increases the willingness of consumers to pay for that product [60].

The brands in their online shops, therefore, focused more on the growing market share of organic products [20]. The indication of organic certification on a product increases its value in the eyes of mothers who buy the product [22]. This is also reflected in the pricing policy: in fact, organic products cost on average more than those without an organic certification on the label. On their online shops, brands can operate with their own sales policy and not depend on the marketing strategies of the product assortment implemented by large retailers, thus offering products that are closer to the needs of purchasing managers and conveying information about the products in a more immediate way [50,61]. In general, the premium price of organic food is affirmed on the Italian market [62]. This trend is confirmed by our results, which show a clear prevalence of organic baby food in the supply of the two sales channels (direct and online). In fact, producers in the market seem to meet the demands of baby food buyers who prefer to procure organic food for their children, concerned about health risks caused by pesticide residues [23,63,64].

Considering the packaging material, large-scale retail chains and producers in online shops adopted the same policy: almost all references were packaged in glass jars. In this type of baby food, in fact, there is still no innovation regarding the packaging material as only glass can undergo the sterilization applied to jars after they have been filled and sealed. This sterilization, which takes place at high temperatures, guarantees the sterility of the product from microbial contamination [65,66]. In addition, the results of this research regarding packaging are in line with consumer preferences that

perceive glass as more sustainable than plastic packaging. Thus, the producers analyzed, both in the LRd and online stores, offered their products packaged according to the needs of purchasing managers, both in terms of sanitary safety and environmental sustainability [60].

The analysis of the claims reported on the product packaging showed some differences in the marketing strategies communication adopted by the companies in the two distribution channels.

Even though companies in the food sector in general are working hard to resolve this growing consumer uncertainty about food safety and are working to reinforce consumers' trust (including communicating their initiatives to increase product sustainability), in the case of homogenized food products for children, companies focus their communication campaigns on healthy claims mainly related to beneficial effects on the body. This is in agreement with the growing attention of consumers in heath of baby, compromising taste and sensory [67]. However, if in both sales channels the most recurrent claims are "with no added salt" and "gluten free), in large-scale distribution chains also other claims, such as "fruit sugar only" and "without added starches", appeared frequently on product packaging.

Also the claims relate to the high nutritional quality of the product were widespread: This is probably due to the producers' willingness to welcome the growing interest of consumers towards the intrinsic quality of the products and their greater awareness towards the fundamental role of nutrition during childhood on the physical and cognitive development of children [66].

While health and quality claims are popular because consumers are looking for this type of information, micro-macronutrients claims are the least used in baby food marketing. These results can be justified by a low average knowledge of the information on the nutritional label by consumers [68]. This explains why marketing does not focus on these aspects. It is much easier for consumers to comprehend generic quality and health claims than specific micro-macronutrients information. However, this result could represent a starting point to work, on the one hand, on information campaigns for the public education and awareness programs to improve consumer knowledge and use of the nutrition label and, on the other hand, to increase the degree of product differentiation based on the communication of the macro and micro elements.

In this research no claims were found related to the product/supply chain sustainability: although interest in environmental and social issues continues to grow in the food market [69], for baby food this trend has not been seen. This result could derive from the type of product analyzed and from the target of responsible buyers: mothers who make purchases must make responsible choices to ensure the proper growth of their child looking to quality. The high emotional involvement that characterizes the decision-making process of choice of baby food products, which therefore probably must satisfy above all the physiological need of the tiniest bodies, providing a relevant influence in marketing. The number of products with claims related to the naturalness for Hp is quite significant and responds to consumers' need to purchase natural food in terms of reduced number of processed ingredients, genuineness, and authenticity. According to [70], consumers prefers purchase food without chemical because for them additives can be dangerous for humans and don't really know the function in agri-food product; the quite high number of naturalness claims in food industry proves it. However, in our research this trend was not shown for all natural claims: for example, baby food without GMOs is less diffuse both in online market and direct distribution channels. This represents a gap between offer and demand because based on [71], responsible for purchasing would be willing to pay more for non-GMO homogenized for their infants. According to [72], for baby food sensorial characteristic are less important in term of purchase, indeed sensory claims find are limited in both channel distribution. if

in general sensory aspects are fundamental for consumers, for baby food product this thesis does not apply: indeed, the final consumers are the infants, not the parents, so it is possible that organoleptic aspects are neglected.

The analysis of the association between the claims sub-categories and product type, origin and certification (regarding specialty products), simultaneously considering the distribution channels variable, showed interesting results about the relationship between the adopted communication strategy not only linked with the sales channel, but especially to the product type and ingredients.

Despite the added value that these label claims can give, the two types of distribution channels adopted the same general pricing policy for homogenized products. For freeze-dried products, on the other hand, prices in the large retail chains were much higher than those found online. This can be traced back to the fact that, in the LMD, there were more references of this type of product and that, therefore, the consumer oriented towards freeze-dried products was more willing to pay for the product sought after. Analyzing the pricing policy applied by large-scale retailers, the highest prices for baby food were found in convenience stores and the lowest prices in discount stores. As far as promotions in stores are concerned, a strategy of offering a price on the product was not applied in order to attract the consumer directly. On the other hand, this distribution format had more convenience packs containing a greater quantity of products at the same price.

By contrast, on the websites there were practically no convenience formats, but a greater discount on the price was applied, even if it was a low percentage compared to the total number of references. Product differentiation on the websites, therefore, was mainly based on the communication of nutritional, health and characteristic aspects of the product. In large retail chains, on the other hand, greater communication was found regarding the Italian origin of the products or raw materials used. Although there is insufficient research on the influence of origin in in purchase of baby food, our research demonstrate that the indication of the national origin represents an important criterion of choice on behalf of those responsible for the purchase of these products as is the case with foods not directed to infants; enhancing the Italian supply chain allows to differentiate oneself within a very competitive market [18,59,73].

5. Conclusions

The objective of this research was to define the assortment characteristics of a specific baby food product (homogenized food) that drives the performance of the Italian baby food market. The supply of Hp was analyzed considering different LRd stores and online shops; subsequently, a comparison between the two different sales channels was made. What has emerged is that both types of distribution try, through their marketing policies, to follow the changes in trends and preferences, especially those of purchasing managers, who are looking for a product with high nutritional value and which are correlated with a large amount of information. In particular, a greater depth of assortment was found in the large-scale retail trade compared to online sales; however, online supply was based on more extensive communication strategies with more information on additional product characteristics, presenting a portfolio of high value-added products. This shows a policy of online brands moving towards greater inclusion of additional information, health characteristics and product convenience for the buyer such as advice and expert opinions. However, the study showed that communication about the national origin of the product and the traceability of the supply chain was more present in products sold at stores. The wide range of products and the high amount of information on the labels of reference

suggest that the offer analyzed responds to changing needs and an increasingly competitive market where product differentiation becomes an important element. The results of this research could be used for the improvement of marketing strategies implemented by retailers and for the development of new products that meet the needs of a specific target. This research lays the groundwork for future research exploring consumer preferences and orientations in order to understand whether product development and communication strategies are heading in the right direction. However, the research shows limitations due to the consideration of a limited geographical area and number of stores. Moreover, another limit could be attributable to the consideration in the research of the only supply characteristics, neglecting, in parallel, the demand for HP. For the future, it may be interesting to investigate the preference of baby food consumers in order to compare the two main components of the market.

This research provides concrete tools to marketing managers to improve the planning and communication strategies of homogenized products for a differentiated and successful sales policy. At the same time, producers can make a more informed and dynamic choice on the distribution chain that can best match the company's offer.

Conflicts of Interest

The authors declare no conflict of interest.

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