Journal of Applied Leadership and Management, 6, 47 - 65

Displays in Food Retailing
An evaluation from a sales perspective

Lorenz Diederichs (ldiederi@amazon.com)

Martin Göbl (martin.goebl@hs-kempten.de)
University of Applied Sciences Kempten, Germany

Purpose: Marketing literature has previously and repeatedly outlined the positive sales effects of displays in food retailing. Therefore, its increasing usage and space allocation is not surprising. Although the promised sales increases of more than 400% should result in even higher usage rates. So the question is if sales and store managers are mismanaging their stores or if a more differentiated evaluation of displays in food retailing necessary. This paper addresses the benefits of displays in food retailing from a holistic perspective, evaluating its overall profitability for stores rather than just sales effects. Additionally it compares displays from a product category's perspective.

Design/Methodology: Based on a theoretical approach and a literature review, hypothesis about the profitability of displays overall and for different product categories are derived. A system to evaluate the profitability of displays based on a broad basis of 231 different product placements in more than 30 different stores within the Edeka Handelsgesellschaft Hesserning was developed. The gathered data was finally statistically evaluated and the hypotheses proven.

Findings: The profitability of displays depends on a variety of indicators. Displays are far away from being the best option to address most of nowadays retail challenges. Nevertheless, the data indicates the potential of displays for food retailing. Displays hosting impulse goods are most profitable, but a systematic approach throughout the supply chain, involving producers, wholesalers and retailers is necessary, to exploit this full potential.

Originality/value: The results are based on more than 3,300 product placements on 231display. The findings and insights are based on a holistic evaluation approach and evaluates the profitability of displays in relation to sales figures, product categories and display characteristics. The findings enable sales and store managers to run retail stores more profitable by simultaneously reducing logistics handling costs and fostering sales. It also helps producers to understand the need to diversify its display offers in order to really generate higher sales volumes.

Keywords: food retail, displays, sales, product categories, logistics, profitability, store management, supply chain management

1 Introduction

Despite a steady, high frequent and dense demand for groceries the bankruptcy of Kaiser's Tengelmann is another prominent example of the high competitiveness in the German food retail industry.

Germany has one of the highest densities of grocery shops worldwide. Consumers can choose out of multiple competitors that are often located next to each other (Nielsen GmbH, 2016, p. 33). Hübner, Kuhn and Sternbeck (2013. p. 400) point out that fulfilling consumer requirement is "doubtless" the prime objective and success factor of B2C retail operations.

So the question arises: What are the consumer requirements in food retailing? A 2012 McKinsey study names instore sales force availability and efficiency, overall store conditions and product availability as key consumer requirements (Eltze, Görgens, & Loury, 2012, p. 14), truly all service orientated goals.

The Nielsen "Retail, Consumer, Marketing" report Germany 2016 illustrates that German food retail consumers are additionally one of the most prize sensitive consumers worldwide (Nielsen GmbH, 2016, p. 66).

These two reports of very prominent consulting companies already indicate a main conflict in food retailing. On the one hand consumers want shopping experiences, Alain Caparros, head of ReWe, lately even predicted the end of classical discounters, because of their spare assortment and limited service quality (Caparros, 2016). On the other hand, price wars discriminate the profit of German food retailers again and again and force smaller competitors to leave the market.

Displays in food retailing seem to be a solution to meet most of the outlined requirements. Their consumer orientated design increase shopping experience by allowing additional price and new-product promotions. Design and the integrated product placement into the display as homogeneous unit also increase overall shop conditions and allow shops to differentiate from competitors (Horstmann & Lingenfelder, 2015, p. 551). Displays also have the potential to reduce instore handling costs by integrating the load carrier as well as the sales space to a homogeneous unit. This advantage is becoming even more crucial as opening hours get increasingly longer and pressure increases on personnel costs.

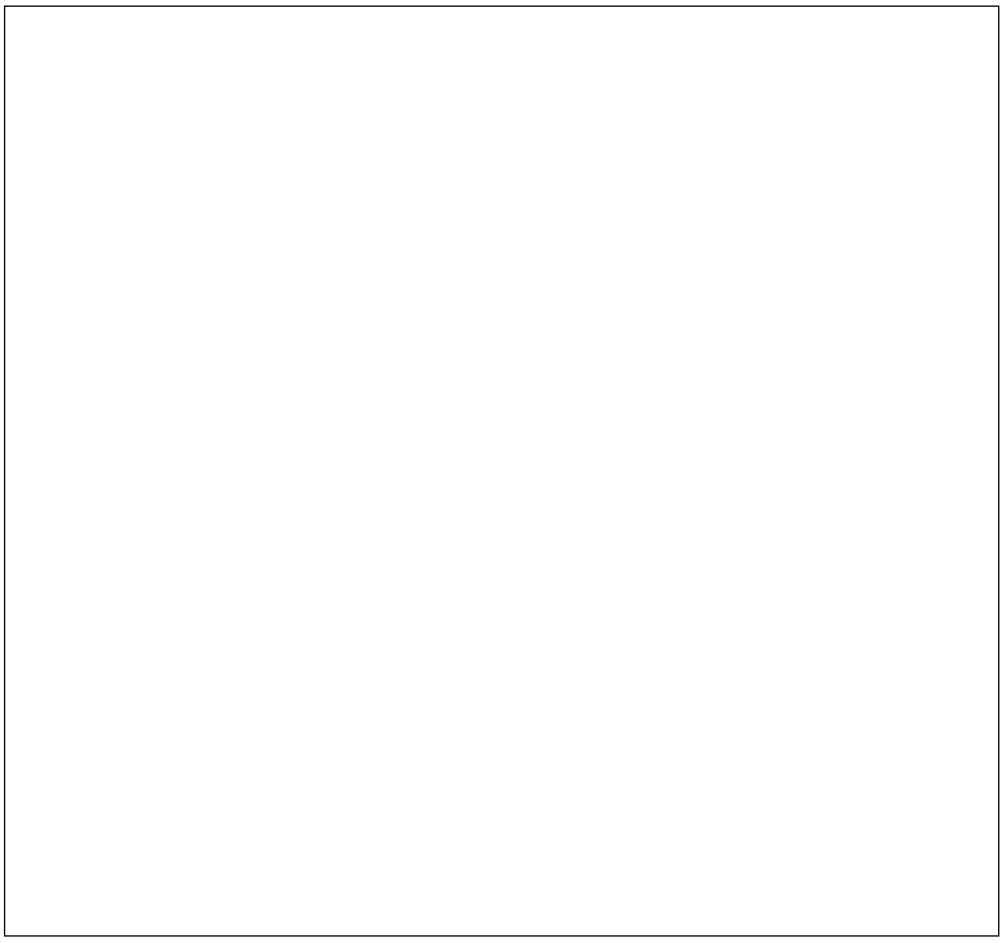
Past marketing surveys have attested displays sales supporting effect of up to 473% (Horstmann & Lingenfelder, 2015, p. 548). So, are displays the silver bullet to all food retailing challenges? The number of displays has been indeed increasing over the past years but not in a ratio the previous thoughts indicate.

2 Displays in Food Retailing – A theoretical approach

In order to discuss the efficiency of displays in more detail, first a common understanding of displays and a theoretical framework of displays in food retailing is necessary. This includes also a distinction of different types of displays and its aims.

2.1 Displays: A functional definition

There is no common definition of displays in academic literature (Horstmann & Lingenfelder, 2015, p. 545). Displays are discussed in logistics as well as marketing literature. In logistics literature displays are consistently mainly assigned to the field of packaging logistic (Haka, Hackenberg & Krampe, 2006, pp. 356-358) (Gudehus, 2005, pp. 557-558).



In food retailing displays serve two very different goals. One group of display has a logistics goal only. This group of display is used to host goods with very high turnover rates and / or unbeneficial packaging characteristics, such as high weight, big size, etc.. Typical product examples for such displays are: PET

bottle drinks, UHT milk, sugar, flour, toilet paper, diapers, etc. Its main goal is to facilitate instore product availability and reduce instore replenishment costs. There are no marketing effects related to these displays. This group of display will not be evaluated further.

The second group is marketing displays. Here the main goal is to increase sales. Whenever the terminology displays is used in this paper, it refers to this group of displays.

In marketing literature displays are linked to non-price-promotion instruments (Gedenk, 2002, pp. 24-27). Horstmann and Lingenfelder (2015, pp. 545-546) see displays as producer-initiated marketing elements to support sales. Displays can be used to affect all four elements of the marketing mix: Product, Price, Promotion and Place. Horstmann and Lingenfelder (2015, p. 545) highlight the communicative power of displays. Gedenk (2002, pp. 25-26) points out that displays have an influence on the presentation (communication) and placement (secondary placement, premium placement) of goods. Horstmann and Lingenfelder (2015, p. 550) also refer to the product category of the marketing mix, when acknowledging the importance of displays for new product market entries. Additionally, displays enable producers to place products for limited time only, without a listing of the items by retailers. This opportunity of displays is often used for seasonal products. Since displays are often connected to price-promotions, they can also be seen as a pricing element of marketing (Gedenk, 2002, pp. 39-45).

Based on the marketing mix, four categories or functions of displays can be distinguished. First, a non-price-promotion function of listed items by secondary (premium) placement (Place) and intense communication (Promotion). The presentation efforts of displays differ strongly (Gedenk, 2002, p. 27). Premium placement and intense communication are elements of all displays (see example Figure 1). Second, a market entry or pre-listing function for new products (Product). Third, the possibility to place products that are available for a limited time only (seasonal items) (Product). The forth function is mainly a buffer function in support of price-promotions (Price). They enable the retailers to have an increased stock of promoted items. And therefore reduce instore logistics costs and out of sales situations.

This distinction has normally no effects on the logistics processes, because form a logistics perspective it is more or less irrelevant which items are placed on the display. Only its buffer function can help to reduce logistical costs. Figure 1 shows the characteristics of the four display types. The outlined characteristics are based on empirical observations.

The obvious marketing aim of displays is to increase sales (Gedenk, 2002, pp.39-45). This aim is to be reached by additional purchases. Assuming that the total demand of a product does not change such sales increases can only be reached by customers changing product brands or stores (Gedenk, 2002, p.47). For impulse goods which are mostly bought unintentionally impulse displays might be able to even increase overall demand.

In logistics literature not much attention has been given to displays so far. Haka, Hackenberg & Krampe (2006, p. 358) briefly mention that displays are assumed to be beneficial for order picking, while on the other hand they often cause higher transportation costs.

The main characteristic of displays from a food retail logistics perspective is a comparatively high number of sales items that are placed on a display. Additionally, the combination of different products of one producer placed on a display is unique in food retailing. Some displays partly host up to twelve and more different sales items. Lastly the combination of load carrier, marketing elements and sales items strongly influence the handling characteristics of displays. Most displays are top-heavy and cannot be stacked. In a previous Edeka internal project it became obvious that transportation processes (internal and external) outnumber order picking processes. So, it can be assumed that displays cause higher overall logistics costs.

2.2 Advantages and Disadvantages of Displays

So the question arises: Which advantages and disadvantages are caused by displays in comparison to regular food retailing products?

	Producers

Advantages	- Increased sales through higher order quantities
	  - Premium and secondary instore product placement
	  - Possibility to place non-listed/ new products instore
	- Direct marketing possibilities (seasonal goods)
	- Transfer of storage costs to retailers / stores

Disadvantages	- Higher costs (additional costs for display production) - Lower sales price to wholesalers / retailers (products on displays are mostly discounted) - Shift of demand rather then increase of demand - No influence on display after the actual sale (possible negative image effects)

Figure 2. Advantages and disadvantages of displays for producers

In accordance with the system aspect of logistics the elements of the supply chain that are most affected by displays should be taken into account when evaluating the profitability of displays. These are the producers (e.g. Kraft foods, Nestle, Unilever, etc.), the wholesalers/ retail companies (e.g. Aldi, Edeka, Lidl, Rewe, etc.) and the stores. For each of them displays bear advantages and disadvantages.

Figure 2 outlines the most prominent advantages and disadvantages of displays for the producers. The main goal is to increase sales. For the producers the retailers are the primary customers, but they are also well aware that the displays need to foster consumer sales as well, if they want to sell many displays. Especially this second aim is addressed to my communicative marketing instruments (layout). The fact that most displays are discounted indicates, that retailers are aware of the benefits of displays for the producers.

	Retailers / Wholesalers
Advantages	- Higher margins - Lower order frequency due to buffer function of displays - Often pre-orders only (no risk of stock-outs or remaining stocks) - Lower order picking efforts / costs
Disadvantages	- Higher storage costs per item through disadvantageous packaging characteristics (height) and lower space utilization rates (sales items/ m^2) - Higher internal and external transportation costs through lower space utilization rates - Higher breakage rates because of disadvantageous packaging characteristics (top-heavy) - More return handling effort / costs

Figure 3. Advantages and disadvantages of displays for retailer / wholesalers

Figure 3 outlines the advantages and disadvantages of displays for the retail chains / wholesalers. Here it becomes obvious that the integration of marketing into the product often negatively impacts its logistics specifications. As already outlined in the previous section, most displays cause overall higher logistics costs, especially internal and external transportation costs.

Figure 4 finally outlines the key advantages and disadvantages of displays for stores. All three figures underline that the main goal of displays is to increase sales. On the other hand, production costs and costs for discounts for producers as well as transportation and logistics costs for retailers are related to displays. In figure 4 logistics costs are named as an advantage as well as a disadvantage.

	Stores
Advantages	- Increased sales - Higher margins - Less out of stock situations - More flexibility - Increased shopping excitement - Possibility to differentiate from competitors - (Reduced logistics costs)
Disadvantages	- Higher order quantities (higher costs of capital bound) - Higher storage costs (storage costs are partly transferred to stores) - Often need to preorder displays (uncertainties) - Often insufficient information about product sales rates (e.g. seasonal or new products) - (Higher logistics costs)

Figure 4. Advantages and disadvantages of displays for stores

The profitability of displays for stores highly depends on the sales of the displayed products. If all or at least most of the placed items are sold in a certain time, it can be assumed that displays cause less handling costs than regular placed goods. So the profitability of displays highly depends on the total sales volume of the products placed on the display. If not, on the other hand, displays cause additional handling costs (e.g. re-arrangement, back-store storage, etc.). In these cases, it can be assumed that displays cause higher instore-logistics costs.

The profitability of displays therefore varies for each of the involved parties. For the system aspect it can be assumed, that the highest overall profitability can only be achieved, if displays are optimized throughout the whole supply chain.

2.3 Literature Review

Marketing literature has outlined the positive effects on sales of displays in several studies. Horstmann and Lingenfelder (2015. p. 548) name 15 studies that have shown such positive effects. It is interesting though, that

these positive effects differ from 79% to 473% sales increase caused by displays, exclusively. The results provide no distinction of displays by product category or any other means, in combination with the high differences in the results, the findings are limited.

Schramm-Klein et al. (2013. p. 12) find that only 33.6% of the shoppers remembered a promotion in store. With regards to displays only 3.7% of the shoppers stated that they remembered the display. Nevertheless, they also found in their study that especially for impulse purchase products displays generate up to 71.4% view-buy-conversions (Schramm-Klein et al., 2013, pp. 27-28).

Additionally, Schramm-Klein et al. (2013, pp. 29-30) find that especially excitement striving shoppers, who decide mainly in store what to shop, are highly affected by promotions such as displays. In Hertle and Weber`s (2010, pp. 34-37) study almost 70% of the shoppers of groceries decided at the POS what do shop. This ratio has increased over the past years and it can be assumed that it will further increase. Displays therefore do not only foster sales but also can help stores to differentiate against competitors. Especially in the food retail industry with its high price competitiveness displays can be a possibility for supermarkets to differentiate against low price discounter.

Schramm-Klein et al. (2013) already distinguish between impulse purchase and planned purchase products and identified differences in the effects of promotions. Even though display promotions were combined with price promotion in their study. Their results suggest that the sales effects of display promotions of impulse purchase products are higher than of planned purchase products.

Besides these product specific influences on the effectiveness of displays as promotion tools, Esch and Redler (2003) identify the size of displays, its design (excitement striven vs. standard design) as well as product categories as influence factors when analyzing the effects of displays. These aspects and the wide variations between the sales effects show that general statements about the sales effects of displays are at least difficult to derive.

Horstmann and Lingfelder (2013) also outline the aim conflict between producers and food retailers. They argue that displays are mainly a producer-driven sales promotion. This corresponds with the relatively high order quantity on the displays. This advantage for producers is a main disadvantage for the store retailers. Displays therefore shift the storage costs (handling, capital, opportunity costs) to the stores. For perishable products or seasonal goods the store retailers have to take the additional risk of not selling the products. Therefore, retailers ask for reduced purchasing prices for displays.

Despite the overall consensus about the positive sales impact of displays, the literature review also outlines that the results of the studies differ widely. Additionally, the application of foreign data to German market is also questionable (Clausen & Schürenberg-Frosch, 2012, p. 70).

Horstmann and Lingenfelder (2015, p. 547) point out that in recent years (later than 2004) no further studies about the effects of displays were provided. Schramm-Klein et al. (2013) also sees the need for additional empirical research for evaluating the effectiveness of promotions. They have conducted an empirical study in one supermarket to evaluate promotion effects of different promotion assets. An interesting aspect of their findings was that the promotion effectiveness varies strongly for different kinds of shoppers. Whereas well organized shoppers that have planned their shopping in advance show almost no affection by display promotions, unlike impulsive shoppers.

In summary the results, the background and the empirical research layout of the studies differ so strongly that a general statement about the effectiveness of displays is impossible.

3 Hypotheses and Design

Based on the previous findings and assumptions the question arises if displays are really that beneficial for retailers. On the one hand the indicated higher logistics costs, that were derived separately, as well as partly contradictory aims of the parties involved, indicate that displays might be far less profitable to retailers as indicated in marketing literature so far.

The high variances in the findings of the marketing studies support this first assumption and additionally indicate differences between product categories. Based on this data and expert reflections the following two hypotheses are derived:

Hypothesis 1:

Despite positive sales effects less than 50% of the displays placements are profitable.

Hypothesis 2:

Impulsive goods are most suitable for display placements.

In order to prove these hypotheses an empirical field research with the Edeka Handelsgesellschaft Hessenring has been conducted. Here sales data was statistically evaluated and the findings were backed by expert interviews with sales and instore management.

3.1 Edeka Handelsgesellschaft Hessenring

Edeka is the revenue strongest German food retailer. In 2015 it generated €48.4 billion with 11,400 stores and 346,800 employees (Edeka, 2017). Unlike other global retailers such as Wal-Mart, Tesco, Schwarz Group or Aldi, Edeka is a registered cooperative of 4.000 independent merchants.

Edeka group is structured in seven regional cooperative entities and headquarters in Hamburg. The headquarters are responsible for the overall national strategy. It coordinates and organizes the national product range, the own-brand strategy and the fruit handling center for all stores. Additionally, it runs the Edeka discount stores Netto.

The regional entities are responsible for supply of the Edeka stores, regional marketing activities, expansion, sales and logistics. Additionally, they run own meat production facilities and mega stores (Marktkauf, Herkules, Cash + Carry).

The empirical study was conducted within the Edeka Handelsgesellschaft Hessenring mbH. It is one of the seven cooperative entities within the Edeka group. Edeka Hessenring is the smallest of the seven regional entities and responsible for the northern and central parts of Hesse, the northern and central part of Thuringia as well as the eastern parts of Westphalia. The area is mainly rural with no major cities. Bigger urban agglomerations are Cassel and Weimar.

In 2015 Edeka Hessenring generated revenue of € 2.268 billion with a net profit of €30.3 million. It employs 8,500 employees and supplies approximately 500 stores in the region (Hummel, 2016). These numbers include the 37 Herkules stores that were the population of the evaluation.

The data collection was done in the Edeka Hessenring headquarter in Melsungen.

3.2 Display Effectiveness

The first step in answering the hypotheses is to measure and evaluate the sales effects of displays. The positive sales effects have been monitored in several studies. There is a general consensus about the sales supporting effects of displays, especially for marketing-focused displays.

But the hypotheses already raise the question, if sales effects alone are a valid instrument to measure the profitability of displays. In this paper it is assumed that sales effects alone only provide insufficient information to determine the profitability of displays. The ideas were discussed in an expert interview with the head of Rheika-Delta (parent company for all Herkules stores) and two further success factors of displays were derived (see table 1).

When evaluating sales effects, seasonal effects need to be excluded. Often seasonal goods are preferred goods for display placements because of its layout related communication possibilities to increase seasonal sales. So, the sales effects of seasonal products placed on displays are to be compared with the sales of the respective product during the same period without a display placement, in order to determine the display related sales effects, only.

Table 1:

Objectives to evaluate display effectiveness

Effect	Explanation	Key figure
% positive sales effects	Percentage of stores that experienced positive sales	> .75
% Sold out	Percentage of stores that sold the number of items on the display in between four weeks	> .6
Average sales increase	Difference of percentage sales increases of stores with and without display placement	> 15%

Another important criterion to evaluate the profitability of displays, is its absolute sales. Displays that's displayed products are not sold in a certain time generate higher capital costs, additional logistics handling costs and opportunity costs. The opportunity costs are the costs for blocking sales space. Four weeks are assumed to be the average placement time of displays.

Table 1 outlines the evaluation method to determine the effectiveness of displays for the retail stores. The key

figures are based on the consideration that if 75% of the stores that placed a display experienced a positive sales trend, a display can be seen as beneficial. The 60% sold out percentage was used, since in this case on average 75% of all items were sold, which is according to store representatives an acceptable rate. Finally, it is assumed that average sales increases of more than 15% are statistically significant.

Displays with percentage sales increase close to 15% were additionally statistically tested (t-test) to proof if the means of the related populations differ significantly (Appendix B). The t-test is a significance test which tests on the basis of two samples, if the means of their population are identical. Detailed information about the t-test can be taken from most statistic literature (e.g. Rasch, Friese, Hofmann & Naumann, 2014).

The application of t-test requires samples with variance homogeneity. In case of inhomogeneity the t-test for unequal variances or so called Welch's test is to be used (Rasch, Friese, Hofmann, & Naumann, 2014, p. 44). The Levene test additionally tests such variance homogeneity.

SPSS was used for all statistics. SPSS automatically applies the Levene test and provides the results for the t-test as well as the Welch's test. Therefore, all statistical requirements to apply each test were met (see Appendix B).

The outlined formulas indicate that sample size has direct influence on the result of the statistic t. An empirical mean difference becomes faster significant for bigger sample sizes (Rasch, Friese, Hofmann, & Naumann, 2014, p. 59). For unplanned tests, a sample size of 30 is recommended. In order to meet this prerequisite sample with less than 7 display placements (sample size 28) were excluded from the data.

3.3 Design

In order to proof hypothesis 1, only sales effects that are directly related to the display placements without any side effects have to be evaluated. Type 1 displays (see figure 1) meet this criterion, exclusively. This type of displays allows the comparison of goods that are placed on displays as well as on primary shelves sales space. In a first step type 1 displays have been separated from the other types.

Once a type 1 display was identified, two SAP queries were conducted. A first one determining which stores received the respective display. In a second query the sales figures of the items on the display were derived for all stores, additionally price-promotions were indicated in the data.

In preparation to answer the second hypothesis the displays have also been separated into five main product categories:

- Impulse Goods
- Basic Food
- Household Goods
- Seasonal Goods
- Beverages

In order to evaluate the profitability of displays according to the success factors outlined in table 1 the raw data was assessed descriptively. In a first step the sales figures of the week of the display delivery and the following three weeks (total of 4 weeks) were compared against the sales figures of the rest of the year. This timeframe was derived from an expert interview with the head of Rheika-Delta in Melsungen. The key assumption behind this timeframe is that most of the shoppers are frequent shoppers. The communicative power of a display therefore exhausts over time. If a display is not sold in between four weeks the remaining items are normally placed at their primary sales space, surplus items are stored in the store internal warehouse.

Despite the fact that all price-promotion related displays (type 4) were already excluded, most of retail products are subject to price promotions at some time. These price promotions were eliminated from the data. This was necessary because price promotions have very strong effects on sales figures (up to 1.000% increase). The weeks of the price promotion were simply erased. This simple method has certainly limitations. It takes for example not into account that promotions often cause sales / demand shifts. But such effects are very complex to calculate and its benefits for the results limited; therefore, this effect has been neglected.

Once this modification was applied to the raw data, the annual average sales of the product and the average sales of the product while being placed on a display were calculated.

Since the sales of the different Herkules stores that were object to that survey differ, the absolute sales figure lacked of comparability. In order to have comparable results the percentages were calculated. This first result outlines the differences in sales for displays in

comparison the average annual sales. Seasonal effects cannot be evaluated with this comparison.

In a second step also the percentage sales of the stores that did not place a display were evaluated for the respective display timeframe. This additional comparison allows the indication and exclusion of seasonal effects.

In a third step the total sales during the four week display placement time were evaluated and compared against the number of products that were placed on the display. The results of this comparison are sellouts. In accordance with the previously mentioned expert interview, it is assumed that displays that are not sold out in the four weeks are mostly not profitable. Displays with a placement time of more than four weeks are dissolved and the remaining sales items are placed on the primary sales space or moved to the instore warehouse, which cause additional handling costs.

The following data exemplarily outline the importance of such evaluation for determining the profitability of displays. The research showed that especially for products with overall small sales volumes the percentage sales increases were comparatively high. Nevertheless, the overall positive effect of these displays is questionable. The “Little Swimmers” swim diapers display is a very good example to outline this effect. This display was ordered by 12 stores and placed beginning at week 26 in 2016. All stores that ordered the display experienced sales increases varying from 70% to 617.19%. The average sales increase for the twelve stores was 331.61%, while the stores that did not order the display only experienced a sales increase of 95.48% during that time. The result indicates two facts, first the general increase in sales during that time suggest that swim diapers are a seasonal good. Second, from a sales perspective it seems that swim diapers are a very good product to be placed on displays, since the average sales increase of the stores that placed a display was 236.13% higher than the ones that did not place a display.

The absolute data shows a more divers result. Out of the twelve stores that ordered the display only six sold more than the 15 items for each of the three products that were placed on the display in the whole year 2016. One store that ordered the display with 15 swim diapers in size 3-4 placed on it, only sold 3 units throughout the year. Undoubtfully, this display placement was inefficient. But since it sold one of them in the monitored first four weeks of the display placement, the percentage increase of sales in the display timeframe for this store is 325%.

All of the evaluations outlined so far are descriptive. Descriptive statistics provide first and general insights but are limited by the significance of its results. In order to provide more solid and statistically proven results, the differences in the average sales of the products that were placed on displays were tested on equality.

The following results are based on a sample of 53 displays. On these 53 displays a total of 231 different products placements were placed. In summary, the results are based on 3,387 product placements in the 16 Herkules stores throughout Edeka Hessenring in 2016.

4 Empirical Results

One result of this study is already that it is almost impossible to give one clear answer which is valid for all kind of displays in food retailing. The results of this study show very different effects of displays in food retailing. Nevertheless, a general sales promoting effect of displays was monitored for the majority of displays.

Appendix A1 shows the descriptive data. The average sales increase of displays throughout all product categories is 33.50% (Δ_2). Out of the total of 3,387 monitored products on displays (n_2) and 231 different product placements (N_2) 2,501 (73.84%) products achieved higher sales when being placed on a display ($x_{increase}$). In 886 (26.16%) cases the display placement had no or negative effects on the sales ($x_{decrease}$). In 1,592 (47.00%) cases all items on the displays were sold in between four weeks (y).

The average sales increase of products placed on displays in comparison to the annual sales of the product (Δ_1) is 45.31%, with a maximum percentage ($Max(\Delta_1)$) of 493.11% (Skittles Wild Berry 174g). On the other side the sales effect of the products placed on the “Russian Standard Vodka” display was negative and even dropped during the display placement time against the average by -23.77% ($Min(\Delta_1)$).

When taking seasonal effects into account, the pure average display effect is a sales increase of 33.50%. Again Skittle Wild Berry generated the highest sales effect of 487.28%. In this category the Jack Daniels display, hosting Jack Daniels & Cola as well as Jack Daniels and Ginger Ale suffers with -172.73% the highest sales decreases. Interestingly sales increased for both products in comparison to the annual sales, but the

sales of the stores that did not place a display outnumbered this effect by far.

Table 2 outlines two general main results. First, the majority of displays generate positive sales effects. Second, the SD as well as the Min(Δ) and Max(Δ) values indicate that the effects differ strongly between displays.

Table 2:
General Sales effects of displays

Displays N_2	Positive sales effect $X_{increase}$	Sales increase Δ_1	$Min(\Delta_1)$	$Max(\Delta_1)$	SD	Sales increase Δ_2	$Min(\Delta_2)$	$Max(\Delta_2)$	SD
231	198	45.31%	-23.77%	493.51%	57.74	33.50%	-172.73%	487.28%	55.94

This variance asks for a more detailed evaluation that asses the data as a whole. The display success factors aim to allow such holistic approach. So in a second step three more evaluations have been conducted. First, it is evaluated in how many cases 75% or more displays generated positive sales effects ($x_{increase}$). Second it has been evaluated in how many cases the sales increase Δ_2 is greater than 15%. Finally, these sales differences were statistically tested if the means parent population are equal or not (see Appendix B).

Table 3:
Sales related success effects of displays

N_2	$\frac{X_{increase}}{n} \geq 75\%$	$\Delta_2 \geq 15\%$	*Sig*. difference of means*
231	102	143	129

** with p = .95*

Table 3 summarizes the results outlined in appendix A1. It already shows a more divers picture on the sales effects of displays. In only 44.16% of the cases 75% or more stores monitored positive sales trends for products placed on displays. This result further indicates that the sales effects vary strongly between the stores and products. Nevertheless, in 147 cases (63.64%) the average sales increase of displays is at least 15%. In 129 (55.84%) cases the sales means of the stores that placed displays are significantly (p = .95) higher than the ones of the stores that did not place displays.

As a general summary the data allows the conclusion that display placements have an overall positive effect on sales. This effect although is not as strong as outlined in most of the marketing surveys.

Detailed Results

The overall results already indicated significant sales variances between stores and products. A more detailed evaluation is necessary to determine the profitability of displays and furthermore appropriately address the second hypothesis. Table 4 indicates two results. First, seasonal goods seem to be in particular suitable for display placements since these placements achieved higher overall and average sales increases. Second, household goods only achieve below-average sales increases.

Additionally, the results indicate that despite similar total average sales increases, impulse goods achieve more significant sales results than basic food items. Impulse goods often outnumber other sales by volume therefore significant results are already achieved by smaller mean differences.

From a more detailed perspective seasonal goods, impulse goods and beverages seem to be more suitable for display placements than basic food items and especially household goods. The profitability of household displays seems already questionable since the average sales increase is only 18.50% and significant differences in the sales means of displays in comparison to annual sales could only be reached for 32.26% of the placements. Also basic food displays only achieved significant sales increases in 48.89% of the placements.

Journal of Applied Leadership and Management, 6, 47 - 65

Table 4:
Sales effects of displays (product categories)

Characteristic	Impulse Goods	Basic Food	Household Goods	Seasonal Good	Beverages	Total
n	1327	1281	329	168	237	3387
$x_{increase}$	1063	888	195	159	196	2501
% $x_{increase}$	80.11	69.32	59.27	94.64	82.70	73.84
Average Δ_2	36.53	36.47	18.50	86.69	21.74	33.50%
Max (Δ_2)	487.28	130.67	141.49	236.13	85.51	
Min (Δ_2)	-27.35	-19.73	-20.57	-7.53	0.74	
N	83	90	31	11	16	231
$\frac{x_{increase}}{n} \geq 75\%$	43	29	8	10	12	102
$\Delta_2 \geq 15\%$	54	51	17	10	11	143
Sig*	58	44	10	8	9	129

** with p = .95*

4.1 Sellout

As outlined in the research design evaluating sales effects alone, provides only insufficient information to determine the profitability of displays in food retailing. Its main limitation is the neglect of the actual sales in comparison to the sales items on the display.

Again the assumption behind that evaluation is that displays that are not sold in four weeks are removed, because they block sales space for more profitable displays and therefore causes opportunity costs. If displays need to be removed, additional handling costs occur. These costs also limit the profitability of displays.

These additional instore costs are very difficult to quantify and were also not part of the data collection. In the expert interview therefore a critical value of 60% sellout was derived, as a profitability indicator. This number takes into account that in these cases on average 75-80% of the displayed products are sold. It also takes the differences in the total sales of the different stores into account. Although Herkules stores are similar by size and concept, still significant differences in sales figures were monitored in the survey.

The data outlines that only 88 (38.10%) display types meet this criteria, which means that 60% of the stores that placed the respective display sold the displayed items in between a four-week timeframe. Table 5, shows the distribution of sellouts. The distribution outlines the already indicated success variances of displays. For 68 of the 231 displays less than 10% of the stores sold all items placed on the display. In 55 (23.81%) cases no store sold all of the displayed items in between four weeks. It can be assumed that in these cases too many sales units were placed on the display and that it therefore was not profitable.

On the other hand, the highest category (more than 90% of the stores sold all items) has the second highest score with 36 counts. 16 (6.93%) of the displayed products were sold out in between four weeks by every store that placed the display. Here it can be assumed that even more items could have been successfully sold if placed on the display. The placement in these cases was profitable, but overall an even higher profitability could have been achieved.

Detailed results

Since the variances of the results hardly allow any prove or disprove of the hypotheses a more detailed look on the results is necessary.

Table 5 outlines the sellout distribution for the different product categories. The data shows that 14 out of the 16 products that were completely sold out were impulse goods, the other two are Dolce Gusto coffee capsules (basic food).

On the other hand, 24 of the 55 products that were not sold completely were household products. Out of the total number of 31 household products that were placed on displays in 24 times no store sold the items that were placed on the display.

Journal of Applied Leadership and Management, 6, 47 - 65

Table 5:
Display sellout distribution (product categories)

Range	Impulse Goods	Basic Food	Household Goods	Seasonal Good	Beverages	Total
<=10%	11	22	28	4	3	68
>10% & <=20%	7	12	2	1	1	23
>20% & <=30%	2	7	0	1	1	11
>30% & <=40%	2	6	1	1	2	12
>40% & <=50%	6	9	0	2	3	20
>50% & <=60%	5	3	0	0	1	9
>60% & <=70%	4	3	0	0	1	8
>70% & <=80%	8	7	0	2	3	20
>80% & <=90%	14	9	0	0	1	24
>90% & <=100%	24	12	0	0	0	36

A detailed look at the display characteristics also shows differences in the average number of displayed products and their quantity. On average there are 2.82 different products with a quantity of 43 on impulse goods displays. Basic food displays show with an average of 4.3 products the highest product diversity per display. Here on average only 23 items per product are placed on these displays. Household goods show the lowest product diversity with 2.15 different products per display. On average 35 items per product are placed on household goods displays. Beverages have the highest product quantity with 47 items per product. Here on average 2.38 different products are placed on a display.

Both facts suggest that from a total and sellout perspective impulse items are most suitable for display placements. In comparison to the sales effect results basic food displays outperform seasonal and beverage displays. The smaller item quantities per product seem to be beneficial for the profitability of basic food displays.

Again household goods underperform. The sellout results also indicate that household displays are not profitable. No household display reached a sellout rate above 40%. Since even the revenue strongest Herkules stores seem to be unable to sellout household goods displays, it can be assumed that pure household displays are generally not profitable.

4.2 Display results

In the previous chapters each success criteria of displays has been introduced and independently evaluated. In order to determine the number of profitable displays these individual success criteria have to be evaluated cohesively.

It is a matter of discussion if a display is assumed profitable when it meets two or three success criteria. Certainly it can be assumed non profitable if it only meets one or even no criteria. If only displays that meet all three criteria (36 out of 231) are defined as profitable hypothesis 1, that less than 50% of the displays are profitable, is to be accepted. If both categories are to be assumed as being profitable 54.11% of the displays would be profitable and it is to be rejected.

Taking into account that the success criteria ‘percentage sales increase’ and ‘sellout’ already allow 25% (for sales increase), respectively 40% (for sellout), outliners, only displays that comply with all success criteria are defined as profitable displays.

In a first step the general positive sales effect has been proven, additionally the success criteria have been individually evaluated and finally the combined look at all success criteria has also proven the fact that less than 50% of the displays in food retailing can be assumed as really profitable. All other displays simply cause too many additional handling costs for the store and are therefore not profitable.

The value of this finding is very limited though. The general results as well as the detailed results outlined that the profitability varies strongly between the displays of the different product categories.

Table 6 therefore illustrates the individual results for the success criteria.

The individual results also show that in none of the categories more than 31.25% (beverages) of the displays met all three success factors. For impulse goods

(67.86%), seasonal goods (81.82%) and beverages (68.75%) at least more than two thirds of the displays met at least two success criteria.

These results still are in contrast to the findings of the named marketing studies of chapter 2.3. Nevertheless, display placements for impulse and seasonal goods, as well as beverages seem to outperform the displays of other product categories. In combination with the proven significant differences in the sales means of also two-thirds of the displays in the named categories, allow the conclusion that displays with impulse and seasonal goods as well as beverages placed on them are mostly profitable for producers and stores.

Table 6:
Profitability of displays by category

Success categories met	Impulse Goods	Basic Food	Household Goods	Seasonal Good	Beverages	Total
0	8	19	14	0	2	43
1	18	31	9	2	3	63
2	39	29	8	7	6	89
3	18	11	0	2	5	36

Such profitability with regards to basic food items is at least highly questionable and a general valid profitability statement is not possible. For household goods the results even indicate a negative profitability.

In summary the second marketing hypothesis can neither be proven nor rejected. Impulse goods are certainly more suitable for display placements than basic food items and household goods. But seasonal goods and beverages placed on displays seem similarly profitable.

5 Findings and Recommendations

The sales data shows that displays are far away from being the universal recommendation to address all grocery challenges. Displays-driven promotions without additional effects only generated average sales increases of 33.50%, far less than the previously assumed more than 400%. The data also showed that simply placing products on displays and therefore increasing sales and profit is certainly not true.

The main marketing advantage of displays is its layout related communicative power. The data showed that impulse and seasonal goods as well as beverages seem to be especially suitable for display promotions. This finding seems logical. The name impulse good already indicates that consumers shop these items impulsively. The communicative power of displays fosters this effect and therefore generates significantly higher sales. With seasonal goods it can be assumed that it is somehow similar. By focusing the communication on the seasonal event, the consumer is reminded on the event and the product. This effect is similar to price-promotions in combination with displays. Here displays also function as a reminder for the advertised product and therefore foster sales.

It is well known that beverage sales highly correlate with weather conditions. For this perspective the positive sales effects of beverage displays can be seen as many small seasonal effects and again the sales increase can mostly be related to impulsive buying decisions.

The direct opposite can be monitored for household goods and partially for basic foods. Undoubtfully household goods purchases are rather planned purchases than impulsive ones. Only very few consumers will impulsively buy washing powder or dishwashing detergent. Here the display sales effect is limited mainly to win the demand of substitute goods. Therefore, it seems logical that the sales effect of household displays is the lowest and less significant.

Basic food displays are somehow located between the already mentioned categories. From a total sales perspective basic food items support display placements because of its high turnover rates. On the other hand, most of basic food items are not shopped impulsively. This limits the display related sales effects.

Displays are producer driven non-price promotions. Therefore, it is not surprising that producers aim to place as many articles on displays as possible. The actual sales data on the other hand indicates that especially displays that have fewer items stored on them are most beneficial for stores.

Horstmann and Lingenfelder have already outlined the idea of a closer cooperation between producers and retailers in increasing the benefits of displays. The findings of this study support this approach. Despite a proven general positive effect on sales the profitability of most of the displays is limited because of low sales ratios.

If displays have to be removed and their remaining products have to be rearranged to the primary sales space most of the previously outlined instore logistics benefits are cancelled out. The outlined example of the Little Swimmers display showed that many stores just do not generate enough sales that displays placement are profitable.

Since the latest trends in food retailing indicate that consumers prefer smaller, more familiar stores rather than mega stores, it becomes obvious that producers and retailers need to define appropriate product quantities that allow producers sales increases but also ensure reduce instore handling efforts.

Store managers should evaluate the profitability of displays mainly from a sale volume perspective. Here a simple calculation can enable them to avoid non-profitable display placements. First they should determine last year's sales of the displayed products and calculate the average weekly sales exclusive price promotions. In a second step they should simply multiply the average weekly sales by four and add 50%. The product quantity of the displayed products should not be much higher than the calculated number.

Producers should diversify their display offers. If they take the different sales volumes of the stores into account they should be able to increase display sales and therefore also the number of total sales items. Different sales margins in relation to the total sales items per display can additionally motivate store managers to choose - in case of doubt - higher order quantities. Although such measures will increase costs for producers initially, these measures should increase total display sales, which should promote the displayed products above average and therefore increase sales in the long term.

6 Summary

6.1 Conclusion

Displays are certainly an essential marketing element in food retailing. Besides its marketing effects displays can additionally decrease instore logistics efforts and costs. Displays can also promote market entries, address seasonal effects appropriately and support price-promotions effectively.

Nevertheless, displays are producers-driven sales promotions. Therefore, display characteristics mainly meet the needs of their producers. This limits the profitability for retailers. For type 1 displays it was proven that less than 50% of the displays meet all three retail profitability categories.

It can be assumed that most of these findings have been experienced and observed by store managers as well and therefore limit the sales of displays in food retailing. This is negative for both, producers and retailers.

In summary nowadays displays, at least type 1 displays are far away from appropriately addressing current and future market challenges in the food retailing industry. With regards to the high market competitiveness, the low profit margins and the inherent risk of a fast developing ecommerce business, it seems essential that producers and retailers cooperate more effectively and appropriately address the needs of both parties.

All in all the findings shows the potential of displays to foster sales but it also outlines that further cooperative steps have to be taken by producers as well as retailers to really unleash the full potential of displays.

6.2 Limitations

Most limitations of such surveys result from the research design. This includes the sample and the evaluation methods. Also this survey has certainly some limitations.

The first limitation is the use of ex post data, without access to further instore information. This is a true limitation because it is assumed that every display order has automatically led to a display placement. Even though this assumption has a strong logically base, it is still possible that ordered displays were not placed, because of multiple reasons such as limited space, contradicting marketing/ advertisement events, etc. Another store related limitation is that the research design allows no statement about the location of the placement. As outlined in chapter 2.3 the location has high influences on the sales.

Despite these two strong store related limitations, it is still assumed that the research design allows general finding and statements. The comparatively high sample

size ensures that outliners have only limited effects on the overall results and ensures that - even if the above mentioned limitations applied to some of the displays - their effects are limited.

Another limitation is that the research design does not monitor sales of substitutive or complementary goods. Such effects have to also be taken into account when evaluating the overall profitability of display placements.

As outlined in figure 1 four types of displays can be distinguished. Although the focus on type 1 displays to exclusively evaluate display related sales effects seems feasible, it also only allows statements about type 1 displays. So all findings described above are valid for type 1 displays, only. But the above-average results for seasonal displays already indicate another important advantage of displays. Because of its communicative elements displays seem to be especially advantageous in combination with other effects, such as seasonal or price promotions. The communicative elements of displays can help to point out these additional effects. These effects have to be evaluated separately to determine overall profitability of displays.

Another advantage of displays that was not or only partly evaluated in this survey is its buffer function. Displays can support and reduce instore logistics costs by buffering products with high turnover rates. This display function is especially beneficial if demand is higher than the number of primary product placements. In these cases store personnel needs to refill primary retail space to avoid out of stock situations. The organization of such stock refills during opening hours is highly complex and costly. The buffer function in combination with the communicative function of displays seems to be highly beneficial for type four displays.

6.3 Further recommended research

The findings, limitations and recommendations show that displays in food retailing are as diverse as their sales effects. But with reference to the initially named store conditions and shopping experience as key success factors in food retailing, the effects and profitability of displays should be further evaluated.

Here a special focus should be laid on instore processes. Besides the obvious marketing related questions also the instore logistics with regards to displays should be further evaluated to really determine the profitability of displays.

7 About the Author

Lorenz Diederichs holds a Master`s degree in Industrial Engineering (Product Creation with a Focus on Production) from the Helmut-Schmidt-University in Hamburg and a postgraduate MBA in International Logistics Management from the Kempten University of Applied Science. After several years in leadership roles in military operations in the German Armed Forces, he joined Edeka Handelsgesellschaft Hessenring as MBA intern and developed an ABC approach for logistics costs. Today he is works as area manager for order picking, packing and shipping with Amazon Logistics AF GmbH in Munich.

Prof. Dr. Martin Göbl has been lecturing in logistics and business management at the University of Applied Sciences in Kempten, Germany since 2006. After graduating as an industrial engineer, he worked in different areas and positions in the area of logistics management. While working he graduated as a PHD. His research interests are the evaluation of services, strategic logistics management and logistics service providers.

8 Literature

Caparros, A. (2016, May 21). „In fünf Jahren gibt es keine Discounter mehr“. (C. Dierig, Interviewer)

Clausen, V., & Schürenberg-Frosch, H. (2012). Unterschiedliche nationale Konsumfunktionen als Quelle konjunktureller Asymmetrien in Europa? In H. Schröder, V. Clausen, & A. Behr (Eds.), *Essener Beiträge zur empirischen Wirtschaftsforschung* (pp. 53-74). Wiesbaden: Springer Verlag.

Eltze, C., Görgens, S., & Loury, M. (2012). Lohnenswerte Investitionen. *Akzente*(2), pp. 8-15.

Esch, F.-R., Redler, J. (2003). *Markenkraft und Impuls – Den POS wirkungsvoll gestalten.* Marketing Journal. 36.ed. Heft 4, pp. 66-68.

Gedenk, K. (2002). *Verkaufsförderung.* München: Franz Vahlen Verlag.

Gudehus, T. (2005). *Logistik: Grundlagen, Strategien, Anwendungen.* Berlin Heidelberg: Springer Verlag.

Hertle, T. und Weber, A. (2009). *Kaufen wir immer das, was wir vorhatten? Wenn nicht, warum?.* planung & analyse, Heft 3/2009, pp. 34-37. Heidelberg

Haka, J., Hackenberg, G., & Krampe, H. (2006). Handelslogistik. In H. Krampe, & H.-J. Lucke (Eds.), *Grundlagen der Logistik: Theorie und Praxis logistischer Systeme (3. ed., pp. 325-384).* München: Bavaria-Druck.

Horstmann, F., & Lingenfelder, M. (2015). POS-Marketing-Verbesserung durch die Integration von Dienstleistern in die Hersteller-Handels-Zusammenarbeit am Beispiel von Display-Promotions. In M. Bruhn, & K. Hadwich (Eds.), *Interaktive Wertschöpfung durch Dienstleistungen: Strategische Ausrichtung von Kundeninteraktionen, Geschäftsmodellen und sozialen Netzwerken* (pp. 541-566). Wiesbanden: Springer Fachmedien.

Hübner, A. H., Kuhn, H., & Sternbeck, M. G. (2013). Retail operations: Why and how retailers benefit from an integrative supply chain management perspective. In T. Wimmer, & S. Hucke (Eds.), *Impulse, Ideen, Innovationen: Kongressband 30. Deutscher Logistik-Kongress* (pp. 395-440). Bremen: DVV Media Group GmbH.

Hummel, M. (2016, July 6). *Edeka-Hessenring in Melsungen baut Marktanteil aus.* Retrieved February 14, 2017, from HNA: Wirtschaft: https://www.hna.de/wirtschaft/edeka-hessenring-melsungen-baut-marktanteil-6546313.html

Krampe, H., & Lucke, H.-J. (2006). Einführung in die Logistik. In H. Krampe, & H.-J. Lucke (Eds.), *Grundlagen der Logistik* (pp. 17-31). München: Bavaria-Druck.

Nielsen GmbH. (2016). *DEUTSCHLAND 2016: HANDEL, VERBRAUCHER, WERBUNG.* Frankfurt: Nielsen.

Rasch, B., Friese, M., Hofmann, W., & Naumann, E. (2014). Der t-Test. In B. Rasch, M. Friese, W. Hofmann, & E. Naumann, *Quantitative Methoden 1: Einführung in die Statistik für Psychologen und Sozialwissenschaftler* (pp. 33-80). Berlin Heidelberg: Springer-Verlag.

Schramm-Klein, H., Mau, G., Dassel, M., Gläser, J., & Schmoll, E. (2013). Wie wirken Promotionstechniken am POS? Ergebnisse einer Kundenlaufstudie. *Planung & Analyse*(1), pp. 1-33.

A1. Sales Effects of Displays

	Impulse Goods	Basic Food	Household goods	Seasonal Goods	Beverages	Total	Percentage
No. Displays	1372	1281	329	168	238	3387	
Positive	1063	888	195	159	196	2501	73.84%
Sellout	816	603	12	56	102	881	46.91%
Average Display effect	36.53	36.47	18.50	86.69	21.74	33.50	
Max. display effect	487.28	130.67	141.49	236.13	85.51		
Min. display effect	-27.35	-19.73	-20.57	-7.53	0.74		
% Positive > 0.75	43	29	8	10	12	103	
% sellout > 0.6	50	31	0	2	5	88	
Display effect > 15%	54	51	17	10	11	143	
3 of 3 success Criteria	18	11	0	2	5	36	15.58%
2 of 3 success Criteria	39	29	8	7	6	89	38.53%
1 of 3 success Criteria	18	31	9	2	3	63	27.27%
0 of 3 success Criteria	8	19	14	0	2	43	18.61%
Significance	58	44	10	8	9	129	55.84%
No Significance	19	38	18	1	1	77	33.33%
No sign. (seasonal)	6	8	3	2	6	25	10.82%

A1. Sales Effects of Displays

Category	**Impulse Goods**										
Display	Katjes Frucht 5f. 164x200g DP				Oreo Mix 2f. 128ST DP		Sarotti Schw.Herren Edelb.160x100g DP		Sarotti Herzkirschen 80x250g DP		
Product	Yoghurt -Gums	Fred Ferkel	Grün-Ohr Hase	Grün Ohr Bärchen	Oreo Original	Oreo Double	Sarotti Schw. Herren	Sarotti Schw. Herren	Sarotti Herz-kirschen	Sarotti Herz-kirschen	Sarotti Herz-kirschen
No. displays placed	17	17	17	17	21	21	8	15	15	11	14
Positive sales effects	10	12	16	13	21	19	8	14	14	11	13
% positive sales effects	58.82%	70.59%	94.12%	76.47%	100.00%	90.48%	100.00%	93.33%	93.33%	100.00 %	92.86%
Sellout	9	9	14	12	4	1	0	0	3	3	2
% Sellout	52.94%	52.94%	82.35%	70.59%	19.05%	4.76%	0.00%	0.00%	20.00%	27.27%	14.29%
Average sales effect without displays [%]	-2.45	1.42	30.86	6.85	-3.68	3.39	-0.95	-10.45	-29.46	-15.19	23.92
Average sales effect with display [%]	15.91	15.04	68.65	33.29	87.02	79.80	34.39	47.27	43.67	40.78	68.40
Average display effect [%]	18.36	13.62	37.78	26.45	90.70	76.41	35.33	57.72	73.12	55.98	44.49
Significance	Yes	Yes	Yes	Yes	Yes	Yes	Yes[4]	Yes[5]	Yes	Yes	Yes

Appendix A2 exemplary outlines how the overall results for Appendix A were derived. These descriptive calculation were applied to all 3387 products on the 231 displays that were evaluated in this paper.

B: Statistics

			Levene's Test for Equality of Variances		t-test for Equality of Means						
			F	Sig.	t	df	Sig. 2-tailed	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
										Lower	Upper
1	Fishermans Friend WildCherry	Equal variances assumed	.458	.499	.202	150	.840	.00022	.00108	-,00192	.00235
		Equal variances not assumed			.207	122.731	.837	.00022	.00106	-,00188	.00231
2	Katjes YoghurtGums	Equal variances assumed	1.070	.301	3.653	1490	.000	.00436	.00119	.00202	.00671
		Equal variances not assumed			3.339	96.109	.001	.00436	.00131	.00177	.00696
3	KatjesTappsy	Equal variances assumed	1.018	.313	1.786	1490	.074	.00285	.00160	-,00028	.00598
		Equal variances not assumed			1.611	95.835	.110	.00285	.00177	-,00066	.00636
4	SarottiSchw Herren	Equal variances assumed	.996	.319	2.034	1508	.042	.00811	.00399	.00029	.01593
		Equal variances not assumed			1.438	27.498	.162	.00811	.00564	-,00345	.01967
5	SarottiSchw Herren	Equal variances assumed	5.288	.585	1.927	1504	.054	.00820	.00426	-,00015	.01655
		Equal variances not assumed			1.996	23.808	.058	.00820	.00411	-,00028	.01669
6	Orbit Spearmint	Equal variances assumed	1.589	.210	1.073	138	.285	.00345	.00321	-,00291	.00980
		Equal variances not assumed			1.141	134.546	.256	.00345	.00302	-,00253	.00942
7	Knoppers	Equal variances assumed	9.840	.002	15.140	1279	.000	.01316	.00087	.01146	.01487
		Equal variances not assumed			12.386	119.433	.000	.01316	.00106	.01106	.01527
8	Knoppers	Equal variances assumed	2.308	.129	4.457	1223	.000	.00537	.00120	.00300	.00773
		Equal variances not assumed			3.824	54.283	.000	.00537	.00140	.00255	.00818
9	Lachgummi Original	Equal variances assumed	.211	.646	4.337	1616	.000	.00384	.00089	.00211	.00558
		Equal variances not assumed			4.046	81.470	.000	.00384	.00095	.00195	.00573
10	Lachgummi Original	Equal variances assumed	1.028	.311	3.331	1584	.001	.00384	.00115	.00158	.00610
		Equal variances not assumed			2.953	44.922	.005	.00384	.00130	.00122	.00646
11	Lachgummi Original	Equal variances assumed	11.639	.001	3.812	1616	.000	.00341	.00089	.00165	.00516
		Equal variances not assumed			3.131	79.855	.002	.00341	.00109	.00124	.00557
12	Lachgummi Original	Equal variances assumed	15.935	.000	1.587	1572	.113	.00219	.00138	-,00052	.00489
		Equal variances not assumed			.845	31.342	.405	.00219	.00259	-,00309	.00746
13	Wrigleys ExtraWhite	Equal variances assumed	11.234	.001	1.125	190	.262	.00243	.00216	-,00183	.00668
		Equal variances not assumed			1.192	180.437	.235	.00243	.00204	-,00159	.00645
14	SnackHits1	Equal variances assumed	.120	.729	3.154	1854	.002	.00431	.00136	.00163	.00699
		Equal variances not assumed			4.035	56.077	.000	.00431	.00106	.00217	.00645
15	SnackHits2	Equal variances assumed	1.303	.255	1.518	150	.131	.01180	.00777	-,00356	.02716
		Equal variances not assumed			1.556	50.527	.126	.01180	.00758	-,00343	.02702
16	Hühnchen Pilze	Equal variances assumed	.437	.509	1.267	1734	.205	.00404	.00319	-,00221	.01030
		Equal variances not assumed			1.168	67.106	.247	.00404	.00346	-,00287	.01095
17	Hühnchen Pilze	Equal variances assumed	3.608	.058	1.375	1706	.169	.00580	.00422	-,00248	.01408
		Equal variances not assumed			1.155	36.055	.256	.00580	.00503	-,00439	.01599
18	ChilliCon Carne	Equal variances assumed	.364	.547	2.187	1734	.029	.00623	.00285	.00064	.01182
		Equal variances not assumed			2.153	67.745	.035	.00623	.00290	.00046	.01201

			Levene's Test for Equality of Variances		t-test for Equality of Means						
			F	Sig.	t	df	Sig. 2-tailed	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
										Lower	Upper
19	ChilliCon	Equal variances assumed	.411	.521	2.568	1706	.010	.00967	.00376	.00228	.01705
	Carne	Equal variances not assumed			2.654	36.633	.012	.00967	.00364	.00229	.01705
20	Acento	Equal variances assumed	.035	.852	1.707	150	.090	.00843	.00494	-,00133	.01818
	Balsamico	Equal variances not assumed			1.658	38.918	.105	.00843	.00508	-,00185	.01871
21	Acento	Equal variances assumed	1.502	.222	1.087	150	.279	.00603	.00555	-,00493	.01699
	Balsamico	Equal variances not assumed			1.161	43.358	.252	.00603	.00519	-,00444	.01650
22	NescDG	Equal variances assumed	1.502	.220	.804	1575	.422	.00273	.00339	-,00393	.00939
	Espresso	Equal variances not assumed			1.138	69.364	.259	.00273	.00240	-,00205	.00751
23	NescDG	Equal variances assumed	.046	.829	1.579	1575	.115	.00321	.00203	-,00078	.00720
	Dallma	Equal variances not assumed			1.837	65.648	.071	.00321	.00175	-,00028	.00671
24	NescDG	Equal variances assumed	1.724	.191	1.092	146	.277	.00352	.00323	-,00285	.00990
	VanMach	Equal variances not assumed			1.145	143.520	.254	.00352	.00308	-,00256	.00960
25	Zitronen	Equal variances assumed	.796	.373	3.160	1678	.002	.00544	.00172	.00206	.00881
	kuchen	Equal variances not assumed			3.107	86.781	.003	.00544	.00175	.00196	.00892
26	Oettcker	Equal variances assumed	.086	.769	1.459	1678	.145	.00242	.00166	-,00083	.00567
	SchokoRK	Equal variances not assumed			1.477	87.318	.143	.00242	.00164	-,00083	.00567
27	Zitronen	Equal variances assumed	.161	.688	2.050	1670	.041	.00369	.00180	.00016	.00723
	kuchen	Equal variances not assumed			2.204	78.671	.030	.00369	.00168	.00036	.00703
28	Oettcker	Equal variances assumed	.027	.870	.014	1670	.989	.00002	.00174	-,00339	.00344
	SchokoRK	Equal variances not assumed			.014	77.541	.989	.00002	.00174	-,00344	.00349
29	Würzgemüse	Equal variances assumed	1.686	.194	1.617	1554	.106	.00276	.00171	-,00059	.00611
		Equal variances not assumed			1.889	37.332	.067	.00276	.00146	-,00020	.00572
30	NoodlesRind	Equal variances assumed	.419	.519	1.264	146	.208	.00502	.00397	-,00283	.01288
		Equal variances not assumed			1.242	127.773	.217	.00502	.00405	-,00298	.01303
31	NoodlesRind	Equal variances assumed	21.638	.000	5.858	1562	.000	.01250	.00213	.00831	.01668
		Equal variances not assumed			4.241	87.600	.000	.01250	.00295	.00664	.01835
32	NoodlesCurry	Equal variances assumed	7.971	.005	3.375	1562	.001	.00617	.00183	.00258	.00975
		Equal variances not assumed			2.789	89.246	.006	.00617	.00221	.00177	.01056
33	PadsBala	Equal variances assumed	.597	.441	1.364	150	.175	.00681	.00499	-,00306	.01667
		Equal variances not assumed			1.253	44.132	.217	.00681	.00543	-,00414	.01776
34	PadsKlassic	Equal variances assumed	1.536	.217	1.519	150	.131	.00807	.00532	-,00243	.01858
		Equal variances not assumed			1.302	41.164	.200	.00807	.00620	-,00445	.02060
35	PadsKräftig	Equal variances assumed	.096	.757	2.324	150	.021	.01127	.00485	.00169	.02085
		Equal variances not assumed			2.563	56.463	.013	.01127	.00440	.00246	.02008
36	PadsKräftig	Equal variances assumed	4.289	.039	3.223	1692	.001	.00865	.00268	.00339	.01391
		Equal variances not assumed			2.581	61.714	.012	.00865	.00335	.00195	.01535
37	Frosch	Equal variances assumed	.293	.589	1.363	150	.175	.00356	.00261	-,00160	.00872
	Zitronenrein.	Equal variances not assumed			1.299	38.187	.202	.00356	.00274	-,00199	.00910

			Levene's Test for Equality of Variances		t-test for Equality of Means						
			F	Sig.	t	df	Sig. 2-tailed	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
										Lower	Upper
38	SagroSpühler	Equal variances assumed	2.234	.135	1.780	1662	.075	.00434	.00244	-,00044	.00913
		Equal variances not assumed			2.171	37.383	.036	.00434	.00200	.00029	.00840
39	SagroSpühler	Equal variances assumed	1.367	.242	-1.623	1686	.105	.00310	.00191	-,00685	.00065
		Equal variances not assumed			-1.599	63.286	.115	.00310	.00194	-,00698	.00077
40	Poliboy	Equal variances assumed	.939	.333	.577	1702	.564	.00282	.00490	-,00678	.01243
	Parkett	Equal variances not assumed			.720	32.909	.477	.00282	.00392	-,00516	.01081
41	PoliboyFlies	Equal variances assumed	1.389	.239	.901	1702	.368	.00548	.00608	-,00644	.01739
		Equal variances not assumed			1.098	32.813	.280	.00548	.00499	-,00467	.01563
42	Poliboy	Equal variances assumed	2.516	.113	1.177	1730	.239	.00430	.00365	-,00286	.01145
	Parkett	Equal variances not assumed			.966	61.799	.338	.00430	.00445	-,00460	.01319
43	FroschGranat	Equal variances assumed	.005	.945	1.184	1482	.236	.00369	.00312	-,00242	.00981
	ApflWM	Equal variances not assumed			1.205	45.765	.235	.00369	.00307	-,00248	.00987
44	Rorax	Equal variances assumed	.177	.674	1.364	150	.175	.00347	.00254	-,00156	.00850
	Rohrfrei	Equal variances not assumed			1.324	85.219	.189	.00347	.00262	-,00174	.00868
45	LittleSwim	Equal variances assumed	2.569	.111	3.626	134	.000	.04630	.01277	.02105	.07155
	Klein	Equal variances not assumed			3.295	73.853	.002	.04630	.01405	.01830	.07430
46	Little	Equal variances assumed	.027	.870	.307	130	.759	.00389	.01266	-,02115	.02893
	Swimmittel	Equal variances not assumed			.311	89.015	.756	.00389	.01250	-,02095	.02873
47	Little	Equal variances assumed	.021	.885	1.489	134	.139	.02476	.01663	-,00814	.05765
	Swimmgross	Equal variances not assumed			1.474	93.906	.144	.02476	.01680	-,00860	.05812
48	DeveleyBBQ	Equal variances assumed	.039	.844	5.551	1722	.000	.01390	.00250	.00899	.01881
	Sauce	Equal variances not assumed			5.543	54.210	.000	.01390	.00251	.00887	.01893
49	PinkGrape	Equal variances assumed	.064	.800	1.136	154	.258	.00375	.00330	-,00277	.01026
	fruitCranb	Equal variances not assumed			1.124	142.068	.263	.00375	.00333	-,00284	.01033
50	Orange	Equal variances assumed	.158	.691	2.938	154	.004	.00834	.00284	.00273	.01394
	Lemongr	Equal variances not assumed			2.946	151.715	.004	.00834	.00283	.00275	.01393
51	Berries	Equal variances assumed	5.935	.016	1.689	122	.094	.00657	.00389	-,00113	.01427
	Guarana	Equal variances not assumed			1.596	82.078	.114	.00657	.00412	-,00162	.01476
52	GrünerTee	Equal variances assumed	.021	.885	2.656	142	.009	.01367	.00515	.00349	.02384
	Mango	Equal variances not assumed			2.731	137.950	.007	.01367	.00500	.00377	.02356
53	AlproMandel	Equal variances assumed	5.288	.022	2.515	1686	.012	.00396	.00157	.00087	.00704
		Equal variances not assumed			3.259	66.848	.002	.00396	.00121	.00153	.00638