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Role of claims on gluten-free cookies' packaging in influencing consumer behaviour. An eye-tracking study¹

Wpływ oświadczeń na opakowaniach ciastek bezglutenowych na zachowania konsumentów. Badanie eye-trackingowe

Abstract

This paper aims to investigate how the number and type of claims placed on gluten-free (GF) cookies packaging impact consumer visual attention and purchase intention, and to compare how consumers who are on a gluten-free diet and those who are not perceive the claims. This article uses the triangulation of two research methods, i.e. eye-tracking (ET), which measures consumer visual attention, and a questionnaire survey. Three self-designed labels for gluten-free cereal cookies with various combinations of health and nutrition claims were assessed. The study shows that both the number and the type of claims on GF packaging impact the visual attention and purchase intention of consumers. Higher number of different claims induces more attention given to all of them but does not lead to higher purchase intention of a certain product. Despite the fact that participants who were on a gluten-free diet had declared that information on the package concerning how the ingredients influenced their health was of high importance, no difference in the visual attention given to claims and purchase intention was found between the followers and non-followers of the diet ($p > 0.05$).

Keywords

visual attention, purchase intention, health claim, nutrition claim, gluten-free diet

Streszczenie

Artykuł ma celu zbadanie, w jaki sposób liczba i rodzaj oświadczeń umieszczanych na opakowaniach ciastek bezglutenowych wpływa na uwagę wzrokową konsumentów i zamiar zakupu, a także porównanie sposobu postrzegania oświadczeń przez konsumentów będących na diecie bezglutenowej i tych, którzy na niej nie są. W artykule wykorzystano triangulację dwóch metod badawczych, tj. eye-trackingingu (ET), który mierzy uwagę wzrokową konsumentów, oraz ankiety. Trzy samodzielnie zaprojektowane etykiety bezglutenowych ciastek zbożowych z różnymi kombinacjami oświadczeń zdrowotnych i żywieniowych zostały poddane ocenie. Z badania wynika, że zarówno liczba, jak i rodzaj oświadczeń na opakowaniach wpływa na uwagę wizualną i intencje zakupowe konsumentów. Większa liczba różnych oświadczeń zwraca uwagę konsumenta, ale nie prowadzi do zwiększenia intencji zakupowej określonego produktu. Pomimo że badani będący na diecie bezglutenowej deklarowali, że informacja na opakowaniu dotycząca wpływu składników na ich zdrowie jest dla nich bardzo istotna, nie stwierdzono różnicy w uwadze wzrokowej na oświadczeniach oraz intencji zakupowej pomiędzy konsumentami stosującymi dietę i jej niestosującymi ($p > 0,05$).

Słowa kluczowe

uwaga wzrokowa, intencja zakupowa, oświadczenia zdrowotne, oświadczenia żywieniowe, dieta bezglutenowa

JEL: M31, M38, D18

Introduction

Despite the development of modern methods of communication, the traditional channel of providing details concerning a food product's

attributes, i. e. the label, still constitutes the main source of information as consumers make their purchase decisions. Recently, the number of product labels with different claims has observably increased (Al-Ani et al., 2016), among

which health claims (meaning any claim that states, suggests or implies that a relationship exists between a food category, a food product or one of its constituents, and health) and nutrition claims (meaning any claim which states, suggests or implies that a food product has particular beneficial nutritional properties) are of great importance (Regulation (EU) No 1924/2006). Canadian research led by Franco-Arellano et al. (2017) found nearly a half of products featured some claims, while a Spanish study (CESNID, 2007) indicated that 43% out of 250 products had nutrition claims (NCs) and 23% had health claims (HCs). Another claim type that is recently often placed on the packaging is gluten-free (GF) statement on condition that the food as sold to the final consumer contains no more than 20 mg of gluten per kg. Franco-Arellano et al. (2017) noted that GF claims were present on 7.3% of pre-packaged food products, making the GF claim the fifth most popular claim on Canadian food. Since gluten is not considered as a nutrient, the gluten-free verbal statement or Crossed Grain symbol (nonverbal claim) are not classified as NCs and are regulated by separate regulations in the EU (Regulation (EU) No. 828/2014).

The influence of claims, in particular HCs and NCs, on consumer behaviour constitutes an interesting issue that has been discussed by a plethora of researchers (Rybak et al., 2021). Meta-analyses conducted by Kaur et al. (2017) showed that most research studies confirmed the claims' positive influence on consumer behaviour. Many research studies have proved that nutrition and health information placed on packaging positively influences product assessment, its valuation and purchase intention and, in the long term, may help promote healthier consumer diets (Chrysochou & Grunert, 2014; Ballco & de-Magistris, 2019; Iles et al., 2018). Similarly, in a variety of studies (Hartmann et al., 2018; Priven et al., 2015) the presence of a „free from” claim (e.g. gluten-free) impacted the consumers' positive evaluation of food products. Such claims induced the health halo effect, and in many cases predicted consumer intention to pay a premium price for products labelled „free from”. Moreover, the category of product bearing a claim and its perceived healthfulness is crucial in shaping consumers' behaviour. Research conducted by Profeta (2020) showed varying perceptions of HCs on healthy versus less healthy foods. Currently, all foods are allowed to bear nutrition and/or health claims, no matter how high their content of e.g. fat, sugars and/or salt is, as long as they comply with the legal requirements of the Claims Regulation (Regulation (EU) No 1924/2006). Basing on the literature review and analysed data, European Commission stated that HCs and

NCs can mask the overall nutritional status of food products, which could mislead consumers attempting to make healthy choices.

Therefore, there is a serious need to study the influence of claims, especially multiple claims, on perception of hedonic products such as cookies with acceptable nutrient profile. As no in-depth research has been conducted to investigate the impact of combining the HCs and NCs with GF claims on consumer behaviour in the purchase process, the GF cereal cookies were selected as a model product. Moreover, we think that there is a need to evaluate the attitude and behaviour of consumers following gluten-free diet (GFD) due to medically approved reasons, as compared to non-followers of GFD, concerning the perception of nutrition and health information placed on packaging, which might also be useful in the future revision of regulations concerning food labelling.

In order to fill in this gap in the literature, we implemented triangulation of two research methods, namely of eye-tracking (ET), which measures consumer visual attention, and a questionnaire survey. The aim of the study was to measure the impact of number and type of claims on consumers following GFD and those not following a diet (nonGFD) in terms of visual attention and purchase intention of GF cookies.

Theoretical background

The increasing provision of nutritional and health information on food labels is resulting in an ongoing research to assess whether the presence of claims translates into improved or worsened utility to consumers. Nevertheless, the assessment of consumer preferences for multiple claims is scarce and it is unclear how consumers value combinations of certain claims and whether they are helpful in the decision process or simply ignored. In some works (Barreiro et al., 2010; Drugova et al., 2020) the multiple claims generally provided no or low additional consumer benefit and were likely ignored, while the results of a study by Ballco et al. (2020) indicated that when NCs and HCs were presented on the label, compared to unlabelled yogurts they increased participants' utility and visual attention. The optimal number of claims was a subject of research by Shu and Carlson (2014). They found that more than three claims (charm of three) are viewed with skepticism led by consumers' persuasion knowledge and can negatively impact the purchase intention. The conflict between information overload and limited processing capacity in the purchase situation results in

information interference and a reduction of the consumers' attention level (Sørensen et al., 2012). Taking the above into consideration, as we designed packaging with total number of three and five claims (HC, NCs and GF claims), we hypothesized:

H1: The number of claims (health, nutrition and gluten-free claims) on the packaging of gluten-free product determines consumer behaviour.

- a) Higher total number of claims on the packaging of gluten-free product leads to higher aggregated visual attention given to all claims combined.
- b) Higher total number of claims on the packaging of gluten-free product negatively impacts purchase intention.

Although nutrition experts emphasize that health benefits come from natural whole foods, consumers nevertheless seem to prioritize certain nutrients when estimating disease risks. Nutrient-centrism thus can be linked with increased use of NCs on packages (Hieke et al., 2016; Duffy et al., 2021) and growing interest in nutrient-related diseases (Franco-Arellano et al., 2017). A study by Iles et al. (2018) proved that the presence of NCs on snack food decreased perception of the presence of certain less healthful nutrients due to the need for cognitive consistency and generalization effect. As a result, the presence of nutrient content claim led to higher intention to choose fortified snack food.

Visual attention might be driven by top-down process (next to bottom-up), which is based on the principle that decision makers preferably look at goal-relevant stimuli (Corbetta & Shulman, 2002). In some studies (Ballco et al., 2019; Steinhäuser et al., 2019), higher attention to specific claim led to a higher choice likelihood. We expect participants to pay attention to NCs as they are relatively simple and well-known statements. As the influence of different number of NCs on product's packaging is not fully studied, we assumed that:

H2: The number of nutrition claims on the packaging of gluten-free product influences consumer behaviour.

- a) Higher number of nutrition claims on the packaging of gluten-free product leads to higher aggregated visual attention given to those claims.
- b) Higher number of nutrition claims on packaging of gluten-free product positively impacts purchase intention.

It has been suggested that consumer attitudes have distinct hedonic and utilitarian components, and that product categories differ in the extent to which their overall attitudes are derived from these two components. Hedonic products are driven by emotional motivations like pleasure and

fun, while utilitarian consumption is functionally oriented (Loebnitz & Grunert, 2018; Garrido-Morgado et al., 2021). The utilitarian-hedonic distinction often coincides with the degree of healthfulness of various foods, such that hedonic foods tend to be viewed as unhealthy, which, in turn, leads to treating product labelling differently, depending on the nature of specific food product. The influence of HCs and NCs on healthy and unhealthy products has been widely studied (Verbeke et al., 2009; Malla et al., 2020; Profeta, 2020) and showed that HCs on unhealthy food products cannot fully induce positivity bias, they do not improve consumer willingness to buy those food products, and in turn HCs can act as negative reinforcement messages because they explicitly name a disease risk (Verbeke et al., 2009). Little focus has been made on the assessment of the effect of NC vs HC on visual attention and purchase intention of hedonic products, but we assumed that the mechanism can be similar as for products perceived as unhealthy. Therefore, we hypothesized that:

H3: The type of claim (health vs. nutrition claim) impacts consumer behaviour which is related to product category.

- a) Visual attention to health claim is lower than that to nutrition claim on gluten-free hedonic product.
- b) Purchase intention of gluten-free hedonic product labelled with a health claim is lower than that labelled with a nutrition claim.

Health value is important in making nutrition-related decisions, so it is assumed that health-driven consumers show more interest in information placed on packaging, particularly in different claims and nutrition information (Bialkova et al., 2016; Hung et al., 2017; Bryła, 2020). Consumers taking part in disease prevention programs or undergoing medical treatment have higher awareness of healthy nutrition, thus they differ in their behaviour compared to young and healthy consumers (Hoppert et al., 2014). Moreira et al. (2019) showed that consumers who follow some kind of diet focus more on food labelling, similarly as do people with healthy eating habits and those who do sports. As Mai and Hoffmann (2012) indicated, we expect that people with health motivation due to being on medically prescribed diet, who in our research are represented by a group of GFD followers, pay more attention to health-related food attributes than non-GFD followers. Therefore, we predicted that:

H4: Information on the food packaging about the impact of their ingredients on consumer health is more important to consumers following a gluten-free diet than to those who are not on that diet.

H5: Consumers following a gluten-free diet pay more attention to health, nutrition and gluten-free claims, and those on a gluten-free diet have a higher level of gluten-free product purchase intention than those not following a gluten-free diet.

Our research was based on conceptual framework summarized in Figure 1.

Methodology

The experiment described in this paper is a part of a larger project concerning consumer behaviour in the gluten free food market. Our research team collected data from 67 individuals (aged 19–55 years; women: 71.6%; with residents of cities over 100 thousand citizens: 67.2%) recruited through the local Polish Coeliac Society website, gluten-free shops in Poznań, and emails among students and employees of university. Among the study group, 37 participants (55.2%) were nonGFD followers, while 30 participants declared following a GFD (44.8%) for health reasons due to celiac disease (53%), gluten intolerance (20%), thyroid disorders, including Hashimoto (10%) and other ailments (17%).

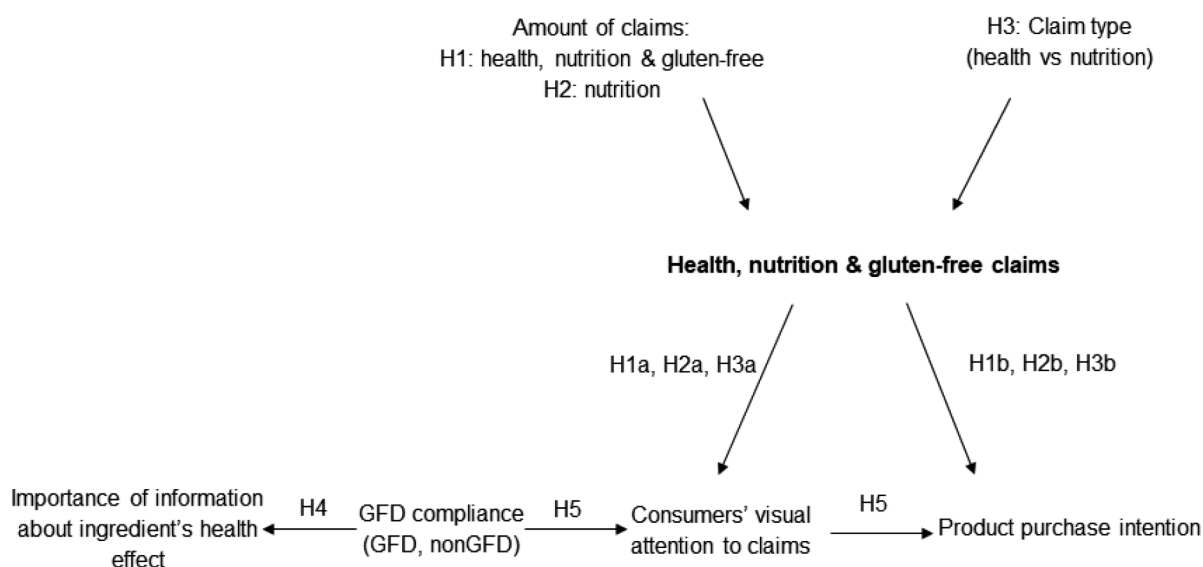
The ET study was prepared using the OpenSesame program. Eye movements were recorded using SMI Eye Tracking Glasses 2 Wireless with the sampling rate of 60 Hz. Before the stimulus display, a calibration of the eye-

tracking glasses to the participants' individual eye characteristics (3-point) was conducted. Participants were randomly assigned to one of the three stimuli, for details on demographics (per condition), see Table 1.

Each participant saw one image of GF cookies' packaging for 7 seconds on a computer screen (Figure 2). Then, each participant's opinion about the product was examined: quality of product, labelling readability, labelling understanding, packaging attractiveness and trust towards the product, participant's purchase intention were measured with a 5-point scale (where 1 was the lowest rate, 5 was the highest rate).

In the second part of the study, participants were asked to fill out a questionnaire. First, they had to answer general questions about how important the information on cookie packaging about the impact of the ingredients on their health is to them. Then they were asked to assess the importance of different claims (NCs and HC) and statements concerning non-nutrient substances that could be placed on cookie packaging in the process of a potential purchase. These claims were defined as follows: high fibre, with no added sugar, source of vitamins (e.g. vitamin B₁), source of minerals (e.g. magnesium), contain beta glucan that has been shown to reduce blood cholesterol, gluten-free product, and without lactose. A 5-point scale was applied (where 1 was the lowest rate, 5 was the highest rate). The GFD compliance was used as a criterion in the statistical analysis. Several

Figure 1. Conceptual framework



Notes: GFD – consumers on gluten-free diet; nonGFD – consumers not following gluten-free diet.

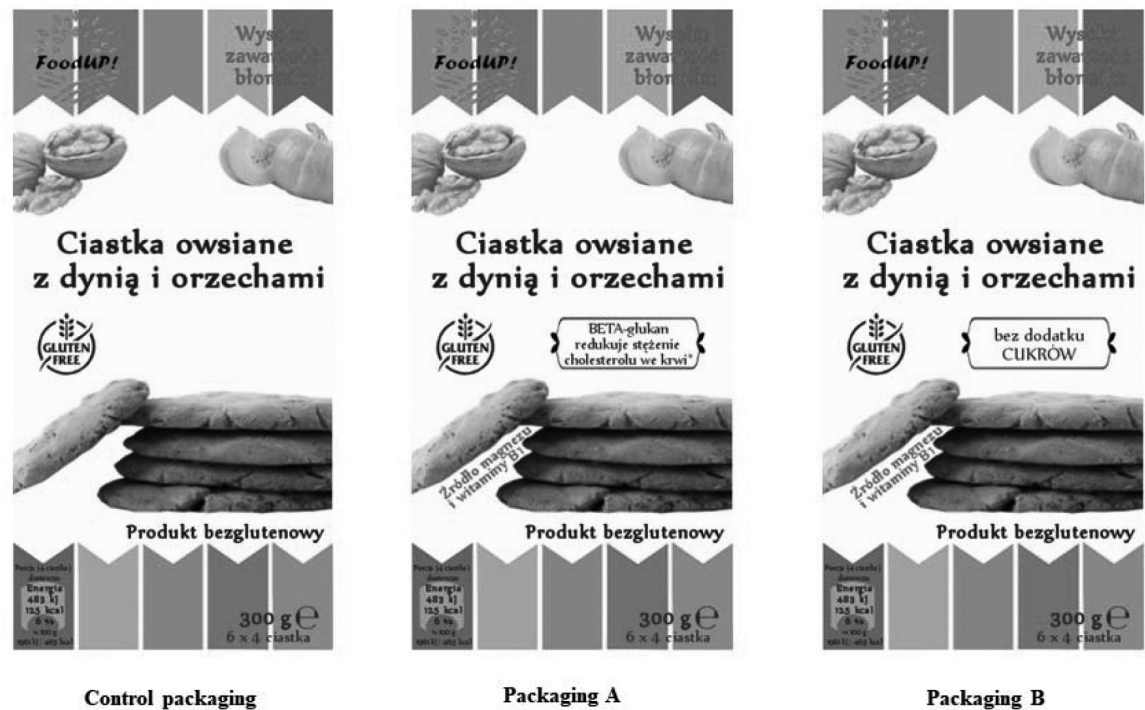
Source: own elaboration.

Table 1. Participant profile per stimuli

Participant		Control packaging [%]	Packaging A [%]	Packaging B [%]
GFD compliance	GFD	50.0	42.1	40.9
	nonGFD	50.0	57.9	59.1
Gender	Male	15.4	36.8	36.4
	Female	84.6	63.2	63.6

Notes: GFD – consumers on gluten-free diet; nonGFD – consumers not following gluten-free diet
Source: own elaboration.

Figure 2. Illustrations of cookies' packaging used in study



Notes: NCs – high fibre (in Polish – wysoka zawartość błonnika); source of magnesium and vitamin B₁ (in Polish – źródło magnezu i witaminy B₁); with no sugar added (in Polish – bez dodatku cukrów); HC – beta glucan has been shown to reduce blood cholesterol (in Polish – beta glukan redukuje stężenie cholesterolu we krwi); GF claim – gluten-free product (in Polish – produkt bezglutenowy).
Source: own elaboration.

socio-demographic questions and those concerning following a GFD were also asked. The stimuli were three self-designed packaging labels for GF cookies (gluten-free oat cookies with pumpkin and nuts) (Figure 2). All information on the label was in the Polish language, as is required by Regulation (EU) No. 1169/2011. Control packaging had three claims – two GF claims (one verbal and one nonverbal) and one NC (high fibre). The packaging A contained five claims – two GF claims (one verbal and one nonverbal), one HC (beta glucan has been shown to reduce blood cholesterol) and two NCs (high

fibre and source of magnesium and vitamin B₁). The packaging B had also five claims – two GF claims (one verbal and one nonverbal) and three NCs (high fibre, source of magnesium and vitamin B₁, and with no added sugar). The HC on packaging A was placed in the same location as NC (with no added sugar) on packaging B. The tested HC and NCs were chosen taking into consideration probable composition of cookies. Selected claims were authorized for use by the EFSA, according to Article 14 of Regulation (EC) No. 1924/2006 and the Annex to the Regulation. The gluten-free claims were in accordance with

Regulation (EU) No. 828/2014 and fulfilled additional requirements for food containing oats. Designed cookies' packages were typical for the selected food category.

ET data were analysed by defining the area of interest (AOI) that referred to the HC, NCs and GF claims and by calculating common metrics, i.e. dwell time, number of revisits, fixation count, average fixation duration for those AOIs (Tullis & Albert, 2013). Then, the aggregated dwell time, number of revisits, fixation count and average fixation duration on combined claims on each packaging were calculated to verify the hypothesis. The means and SD were calculated for declaratory questions. For data with normal distribution, the Student's *t*-test and ANOVA were conducted, whereas for data that did not have normal distribution, the Mann-Whitney *U* test and Kruskal-Wallis test were carried out. The LSD post-hoc test was performed where appropriate. The level of statistical significance was set at $p = 0.05$. To evaluate the strength of an effect (the strength of the difference between groups, or the influence of the independent variable), effect size statistics (*r* statistics) were calculated. The *r* statistics were reported using Cohen (1988) criteria of 0.1 = small effect, 0.3 = medium effect, 0.5 = large effect (Pallant, 2011). SPSS Statistics 23.0 was employed to verify all of the hypotheses.

Findings

The impact of the number of claims placed on packaging on consumer behaviour

The declaratory opinions about the packaging showed that cookies labels are moderately attractive, while the information presented is highly understandable and readable (Table 2). This allowed us to assume that stimuli were well designed and we proceeded with analysis.

The influence of the number of claims on consumer behaviour was assessed through comparison of ET parameters for three claims placed on control packaging and five claims on packaging A and B (control vs. A+B). The aggregated ET parameters for claims' AOIs on each packaging were calculated. Then, the mean values of those parameters for packaging A and B were obtained. The aggregated dwell time on three claims on control packaging ($m_{control} = 620$ milliseconds (ms)), was much shorter than aggregated dwell time on five claims on packaging A and B ($m_{A+B} = 1591$ ms, $U = 170.5$, $z = -3.124$,

$p = 0.002$, with a medium effect $r = 0.42$). Significant difference in the fixation count across two groups ($m_{control} = 2.43$, $m_{A+B} = 5.76$, $U = 371.00$, $z = -3.693$, $p = 0.000$, with a medium effect $r = 0.45$) and average fixation duration ($m_{control} = 289$ ms, $m_{A+B} = 641$ ms, $U = 170.50$, $z = -3.328$, $p = 0.001$, with a medium effect $r = 0.45$) was found. The Mann-Whitney *U* tests showed that higher number of claims leads to higher visual attention that is given to them as calculated based on dwell time, fixation count and average fixation duration, which allowed us to accept H1a.

The impact of the number of claims on the cookies' packaging on consumer purchase intention was verified with use of the Mann-Whitney *U* test. The analysis showed that participants expressed equal interest in purchasing cookies with either three or five claims ($m_{control} = 3.52$, $m_{A+B} = 3.73$, $U = 400.5$, $z = 1.115$, $p = 0.265$), which did not allow us to accept H1b.

In order to verify H2, results for three packaging with different number of NCs were analysed. A Kruskal-Wallis test revealed a statistically significant difference in aggregated dwell time levels across three stimuli (χ^2 statistic is 8.83, $p = 0.012$, with a medium effect $r = 0.43$). The dwell time on high fibre claim on control packaging was lower ($m_{control} = 310$ ms) than on two AOIs combined (high fibre and source of magnesium and vitamin B₁) placed on packaging A ($m_A = 371$ ms) and three NCs combined placed on packaging B (high fibre, source of magnesium and vitamin B₁ and with no added sugar) ($m_B = 928$ ms). The number of revisits to the claims' AOIs showed statistically significant difference (χ^2 statistics is 9.373, $p = 0.009$, with a medium effect $r = 0.30$) with the highest result for packaging B ($m_B = 0.80$). The number of fixations was also the highest for packaging with three NCs ($m_B = 3.25$), which differed with number of fixations on two claims ($m_A = 1.31$) and one claim ($m_{control} = 1.24$) (χ^2 statistics is 8.915, $p = 0.012$, with a medium effect $r = 0.42$). The average fixation durations were significantly different ($m_{control} = 123$ ms, $m_A = 192$, $m_B = 439$ ms, χ^2 statistics = 12.856, $p = 0.002$, with a large effect $r = 0.55$). The Kruskal-Wallis tests showed that higher number of NCs on the cookie package leads to higher participant's visual attention to them, as calculated via the analysed parameters, which allowed us to accept hypothesis H2a.

The impact of the number of NCs on a consumer's purchase intention was examined by carrying out the Kruskal-Wallis test. Consumer's willingness to buy a particular product significantly differed (χ^2 statistic is 6.291, $p = 0.043$, with a medium effect $r = 0.27$) (Figure 3) with the most interest in packaging B with three NCs. The

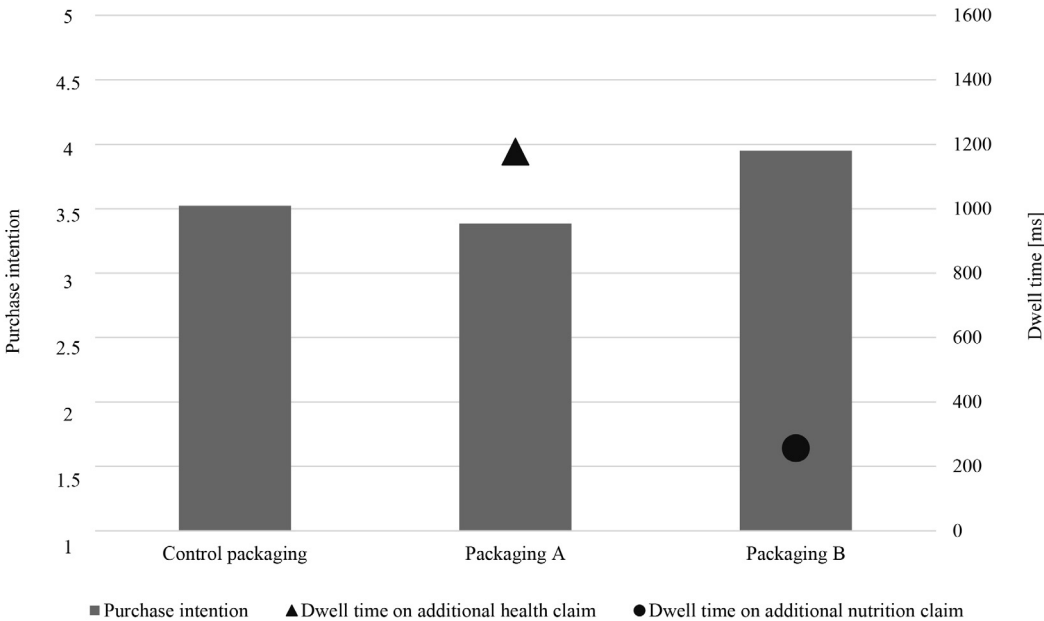
Table 2. Participants' declaratory opinions about the products and their packaging

Aspects	Control packaging		Packaging A		Packaging B		<i>p</i>
	Mean	SD	Mean	SD	Mean	SD	
Quality of product	3.19 ^a	0.57	3.68 ^b	0.67	3.73 ^b	0.55	0.004
Labelling readability	3.69 ^a	0.88	3.58 ^a	1.17	3.91 ^a	0.92	0.528
Labelling understanding	4.04 ^a	0.77	3.84 ^a	0.90	4.36 ^a	0.66	0.112
Packaging attractiveness	3.19 ^a	0.98	3.32 ^a	0.88	3.45 ^a	0.91	0.615
Trust towards the product	3.12 ^a	0.99	3.53 ^{ab}	0.70	3.82 ^b	0.85	0.050

Notes: *a, b* – mean values followed by different lowercase letters are significantly different ($p < 0.05$). Scale: 1 – very low, 2 – low, 3 – neither low nor high, 4 – high, 5 – very high.

Source: own elaboration.

Figure 3. Purchase intention and visual attention given to health and nutrition claims on cookies packaging



Notes: PI scale: 1 – definitely no, 2 – rather no, 3 – difficult to say, 4 – rather yes, 5 – definitely yes; ms – milliseconds.

Source: own elaboration.

average purchase intention level equalled to 3.95 on a 5-point scale, and it was higher than those for the control packaging ($m_{control} = 3.52$) and packaging A ($m_A = 3.38$) (Figure 3). The obtained results allowed us to accept H2b, which proved that purchase intention is higher for cookies labelled with a higher number of NCs.

The declaratory opinions about products and their packaging partially correspond to the above results. Product B was assessed to have the

highest quality ($m_B = 3.73$), as well as product A ($m_A = 3.68$), significantly higher than control ($m_{control} = 3.19$) ($p < 0.05$). Similarly, the trust in product B was significantly higher ($m_B = 3.82$) than for the control ($m_{control} = 3.12$), which is in line with results of buying intention. The evaluation of the packages' attractiveness, labelling readability and labelling understanding did not differ statistically between the stimuli ($p > 0.05$) (Table 2).



Influence of the type of claims on consumer behaviour

The Student's *t*-test was carried out in order to test whether there was a difference in visual attention paid to different types of claims placed in the same location on label (HC beta glucan has been shown to reduce blood cholesterol on packaging A vs. NC with no added sugar on packaging B) (H3a). The effect of claim type was significant for two ET parameters (dwell time and fixation count). Dwell time on HC ($m_{HC} = 1177$ ms) was nearly five times longer than on NC ($m_{NC} = 256$ ms) ($t(12.53) = 2.17, p = 0.014$) (Figure 3). The number of fixations differed explicitly, i.e. $m_{HC} = 4.08$ and $m_{NC} = 1.10$ ($t(12.99) = 2.27, p = 0.010$). Conversely, the number of revisits ($t(17.02) = 1.52, p = 0.098$) and average fixation duration ($t(31) = 0.586, p = 0.563$) did not differ significantly. The results showed that H3a was rejected.

The Mann–Whitney *U* test revealed a statistically significant difference in purchase intention levels across two different stimuli ($U = 181.00, z = -2.191, p = 0.028$, with a medium effect $r = 0.30$). The participants declared that they preferred to buy products with additional NC ($m_B = 3.95$) than products with additional HC ($m_A = 3.38$) (Figure 3), which supports H3b.

The impact of GFD compliance on packaging perception

In the next step we assessed the impact of GFD compliance on the declarative importance of information regarding certain ingredient's health effect on cookie's packaging. The Mann–Whitney *U* test was carried out and it confirmed H4 ($U = 393.50, z = -2.097, p = 0.036$, with a medium effect $r = 0.26$). For participants who had declared following

a GFD such information on the packaging was more important ($m = 3.77$ on a 5-point scale) than for those who were not following a GFD ($m = 3.19$).

Moreover, further analysis allowed us to examine which claims on the cookie packaging were crucial for participants who complied with a GFD. The mean values of the importance of claims on cookie packaging, such as source of minerals (e.g. magnesium), gluten-free product and without lactose, significantly differed for both groups ($p < 0.05$) (Table 3). NCs such as high fibre, with no added sugar, source of vitamins (e.g. vitamin B₁) and the HC contain beta glucan that has been shown to reduce blood cholesterol were equally significant for both GFD and nonGFD participants. The claim regarding beta glucans was the least important for both groups and was assessed at a level of 2.41 for nonGFD and at 2.80 for GFD participants, whereas the NC with no added sugar turned out to be of high importance for GFD participants ($m = 3.77$).

Two-way ANOVA was conducted to verify H5, which describes the impact of GFD compliance on visual attention given to health, nutrition and gluten-free claims and to the purchase intention of cookies. Our findings revealed that compliance with GFD does not simultaneously impact visual attention given to claims and consumer willingness to buy a product ($p > 0.05$), thus H5 was rejected (Table 4). The values of all the ET parameters analysed here were statistically similar for both groups of participants.

Discussion and implications

The findings presented here offer new insight into the way how claims on gluten-free product

Table 3. Importance of possible claims on cookies' packaging

Claim on cookies' packaging	GFD		nonGFD		<i>p</i>
	Mean	SD	Mean	SD	
High fibre	3.27	1.17	3.51	1.26	0.329
With no added sugar	3.77	1.36	3.35	1.23	0.112
Source of vitamins (e.g. vitamin B ₁)	3.30	1.05	3.35	1.18	0.633
Source of minerals (e.g. magnesium)	3.13	1.17	3.59	1.28	0.038
Contain beta glucan that has been shown to reduce blood cholesterol	2.80	1.24	2.41	1.14	0.201
Gluten-free product	4.93	0.25	1.76	0.83	0.000
Without lactose	3.57	1.61	2.00	1.31	0.000

Notes: Scale: 1 – definitely unimportant, 2 – rather unimportant, 3 – difficult to say, 4 – rather important, 5 – definitely important.
Source: own elaboration.

Table 4. Impact of GFD compliance on visual attention given to claims and purchase intention of products

Parameter	Control packaging				Packaging A				Packaging B				F*	p*
	GFD		nonGFD		GFD		nonGFD		GFD		nonGFD			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Dwell time [ms]	605	585	637	402	1766	1802	2060	1771	1421	1096	1318	987	2.21	0.104
Revisits	0.64	0.81	0.50	0.71	1.00	1.23	0.88	0.84	1.13	1.25	1.00	1.21	1.99	0.134
Fixation count	2.82	2.44	2.00	1.25	6.40	5.32	7.13	5.08	5.13	3.04	5.00	3.44	2.28	0.097
Average fixation duration [ms]	262	237	319	196	563	280	631	321	707	516	637	494	0.81	0.496
Consumers' purchase intention	3.73	0.65	3.30	0.68	3.20	0.84	3.50	0.76	3.75	0.89	4.08	0.52	x	x

*based on two-way ANOVA calculations.

Source: own elaboration.

affect consumer behaviour. They constitute valuable contribution to the existing literature and can provide both producers and marketing departments with useful food labelling guidance.

The study shows that both the number and the type of claim on GF packaging impact the visual attention and purchase intention of consumers. Longer visual attention was observed in case of HC in comparison to NC presented in the same location on different cookies' packaging, however it did not result in higher purchase intention. Conversely, product with an additional NC had higher purchase likelihood than other product. The individual importance of a claim and familiarity with it could have impacted the visual attention that was given to it (Hieke et al., 2016). The results of the declaratory research showed that the claim with no added sugar was much more important to consumers than the claim contain beta glucan that has been shown to reduce blood cholesterol, and we think that selected HC might not have been familiar to some of the participants, similarly, as it was proved in the study of Diaz et al. (2020). Because there are many factors that influence where a participant directs his/her eyesight, experience with the tested stimulus (the so-called task experience) is one of them. The more novel and visually complex a stimulus is, the more visual attention it attracts and the longer the subject's viewing time is on that stimulus (Morrison & Dainoff, 1972). The consumer's earlier experience with a specific stimulus accelerates its identification and shortens the interpretation time. Therefore, one practical implication is that in order to capture the attention of consumers, the introduction of products with claims that are not commonly

applied or will be novel on packaging of foods from given category is advised. Simultaneously, the claims must be easily understandable and should not be written in complex scientific language (Diaz et al., 2020), as additives and ingredients that are difficult to pronounce and are not widely known are perceived as more harmful (Maruyama et al., 2021). In our research longer fixation duration on the HC could have been impacted by the length of the claim, which thus required more cognitive effort to become acquainted with.

Lower purchase intention of product with additional HC than additional NC confirms our assumption that HC on hedonic products, similarly to HC on unhealthy products, negatively impacts purchase intention as opposed to NC. Moreover, the number of appropriately chosen claims seems to be of great importance. In our study, the packaging with the highest number of NCs (packaging B) collected the highest likelihood of purchase and was evaluated as the most trusted. The relation observed could have been enhanced by participants' profile. In our study, mostly women, educated persons and rather young participants took part. This is in line with the findings of Cavaliere et al. (2015), who found that females and consumers with higher nutritional awareness, for whom the household well-being is important, dedicate particular attention to NCs, whereas HCs are of interest to older consumers with a limited income.

Consumers have different information needs towards food products that correspond to their attitudes and motivations regarding their health and well-being. Labelling plays crucial role in the

process of meeting these needs, as it is available at a key point when the consumer is faced with the product and makes a purchase decision. An analysis of the impact of GFD compliance on consumer behaviour has provided interesting results. Participants following GFD declared that the importance of information on the packaging about how ingredients impacted their health was higher than among those not following the diet. Yet these consumers' visual attention and purchase intention, measured in a real-time experiment, showed contradictory results. Likewise, in a study by Hoppert et al. (2014), consumers with a considerable type 2 diabetes risk rejected non-degreased yoghurt when the labels were presented, but in the sensory test the group showed a strong preference for a product with a higher fat content. In our research the results of the declarative studies indicated that participants who can be considered as having health-motivation due to medically guided diet, as opposed to nonGFD consumers, considered the information regarding health on the packaging more relevant, but the experiment showed that the evaluation of a product can be processed rapidly, even with no conscious awareness. This finding supplements our previous work (Sielicka-Różyńska et al., 2021). Such outcome could be due to evaluation of hedonic product, which is typically based on overall emotional impressions, as consumers seek for products providing the desired consumption experiences (Garrido-Morgado et al., 2021).

NCs and HCs, as well as all-natural and organic labelling, are often argued to be used as marketing tools rather than to help consumers make more informed decisions about foods (Amos et al., 2019; Pereira et al., 2019). As a result, consumers still don't know which foods contribute to their health and well-being and which are unhealthy. It is even more important in case of GF products, as many consumers perceive them as more healthful, only due to bearing a GF claim and decide to adopt a GFD without any guidance by a health care provider or dietician. Moreover, many new companies are starting to produce GF products but they lack knowledge and expertise in understanding their consumers' perception. Then they face problems with designing appropriate labels. Even though the current legislation (Regulation (EU) No. 828/2014) provides requirements how to inform consumers on the

absence or reduced presence of gluten in food, details of the label is broadly at the discretion of manufacturers, thus causing ambiguities. This research shows that more different claims induce more attention paid to them, but without translating into higher purchase intention. Use of combination of NCs and HCs with GF claims should be deliberate and always linked to the overall product characteristics. The findings of this work correspond with the EU strategy focused on improving consumers' understanding of front-of-pack nutrition labelling to ensure a high level of consumer protection.

Limitations and suggestions for further research

Although this study provides new insight into the influence of claims on consumer perception and purchase behaviour of GF product, it has some limitations that offer opportunities for future research. The participants of this study evaluated one GF product, thus future studies could introduce other products that are relevant to GFD consumers, both hedonic and utilitarian, e.g. snacks, breads, pastas or ready-to-eat meals, which would provide a more comparative context. As a significant difference in the importance of the „without lactose” statement was found between the study groups, and the researches confirm that GFD consumers often share comorbidities of autoimmune nature (Kim et al., 2019), it could be interesting to expand the research group in order to evaluate the influence of intercurrent food allergies on the perception of claims. Moreover, the influence of other NCs and HCs could be assessed.

The cookies had a defined flavour (pumpkin and nuts), which might have impacted the participants' overall purchase intention. We realized that we should have explored the participants' individual preferences towards cookies to reduce the impact of product attributes other than claims on product perception. Our research took place in a laboratory conditions. The results might differ from consumer choices in a real store as the laboratory setting may bias the participants' choices and gazing behaviour.

Notes/Przypisy

¹ The authors are grateful to Ms. Joanna Brzezińska for providing her assistance during experiment and great support in designing the packaging.

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