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Abstract

Purpose: The palm oil debate has become highly polarized~~been very heated~~ in recent years and is of crucial importance for multinationals and their ~~image~~polices. This paper investigated the consumers' response toward product packs communicating this food ingredient in different ways: through "palm oil free" and "with sustainable palm oil" claims or without mentioning it.
Design/methodology/approach: A mail survey with a sample of 191 consumers was conducted. Respondents were equally and randomly distributed among the experimental conditions. The hypotheses were testes by a between subjects factorial design.
Findings: Results revealed that consumer exposed to the "palm oil free" products showed a lower risk perception compared to those exposed to the "with sustainable palm oil" products and to products without claim. Moreover, the product evaluation was better in the "palm oil free" condition compared to the "with sustainable palm oil" condition. No differences emerged in attitude, expected tastiness and willingness to pay.
Research limitations/implications: The study sheds light on consumer valuation of palm oil products and provides some useful managerial implications to manufacturers and product managers.
Originality/value: Results enrich the literature on food claims on pre-packaged foods as source of information and on consumers' perception toward palm oil.

Keywords: palm oil, nutrition claims, attitude, risk perception, product evaluation, expected tastiness, willingness to pay

Introduction

This paper aims to contribute to the knowledge on the consumer-product relationship by focusing on palm oil, a very controversial food ingredient. The palm oil debate has become highly polarized~~been very heated~~ in recent years and is of crucial importance for multinationals and their ~~image~~polices. The main accusations concern the detrimental effect on the natural environment and the sustainability of producing communities. Indeed, in many areas the growth of palm oil production is a major cause of pollution problems, land use change and deforestation, with consequent implications for biodiversity (Oosterveer, 2014; Saswattecha et al., 2015). The palm industry is also associated with neglect of land tenure rights, exploitation of labour and disregard of basic human rights (e.g. Cramb & Sujang, 2011; Pye et al., 2012).

Although a global sustainability standard for the palm oil production – the Roundtable on Sustainable Palm Oil (RSPO) – was established by multi-stakeholders to respond to the aforementioned concern, only about 20 per cent of the palm oil on the world market is produced with the RSPO certification. In addition, some advocacy groups denounce a possible harmful effect to health caused by the massive use of this vegetable oil in food products.

In the face of the extensive scientific research on the environmental and health impact of palm oil crops (e.g. Fitzherbert et al., 2008; Hansen et al., 2015; Koh & Wilcove, 2008; Lee et al., 2014; Obidzinski et al., 2012; Reijnders & Huijbregts, 2008; Saswattecha et al., 2015), studies investigating consumers' perception and evaluations toward this ingredient are rather limited (Aguiar et al., 2018; Disdier et al., 2013; Hartmann et al., 2018). This despite the fact that companies are increasingly using nutrition claims on pre-packaged foods to meet market needs and inform about the absence of palm oil. The reason for this behaviour lies in the fact that consumers perceived claims on pre-packaged foods as a highly credible source of information and use them to select food products (Campos et al., 2011; Hartman et al., 2018). Among these, "nutrition claim" means any claim which states, suggests or implies that a food has particular beneficial nutritional properties due to (a) the caloric value ("provides", "provides at a reduced or increased rate or", "does not provide") or (b) the nutrients or other substances ("contains", "contains in reduced or increased proportions", "does not contain") (European Commission Regulation No. 1924/2006). Many researchers analysed the impact of nutrition claims on consumers' assessment of foods, particularly with regard to their healthiness (e.g. Andrews et al., 2013; Aschemann-Witzel & Hamm, 2010; Hartmann et al., 2018; Lähteenmäki et al., 2010).

The proposed study aims to fill the knowledge gap on palm oil claim effects analysing the consumers' response to different packaging communication strategies. To this end an empirical research was performed to evaluate their perception toward (a) "palm oil free" labelled products, (b) "with sustainable palm oil" labelled products and (c) products without claim. Specifically, consumers' attitude, risk perception, product evaluation, expected tastiness and willingness to pay were compared between the three identified ways to communicate this food ingredient. Results shed light on consumer valuation of palm oil products and contribute to the literature on food claims on pre-packaged foods as source of information. Guidance to manufacturers and product managers for the understanding of consumers' perception toward palm oil and the marketing role of nutritional claims are also provided.

The paper is organized as follows. The next section reviews the relevant literature and proposes the research hypotheses. Section "Method" focuses on the research design, the material used as a stimulus and the data collection procedure. The subsequent sections present the numerical results and discussion, highlighting theoretical and managerial implications and recommendations for further research.

Literature review and research hypotheses

In the past decade, consumption of vegetable oils ~~are rapidly~~is increasing ~~expanding~~ (Clay, 2004). Among these, palm oil is the most produced and consumed worldwide (Fitzherbert et al., 2008; Hansen et al., 2015). Whilst palm oil has been grown commercially since the 1960s (McCarthy & Cramb, 2009), its

production has been massively intensified from the mid-2000s. From 15.2 million tons in 1995, global production increased to 73.5 million tons in 2018 (European Palm Oil Alliance; Statista). The growth in demand for palm oil is due to its large range of use, from foods to cosmetics, combined with a competitive market price (MPOB, 2013). The most recent statistics indicate that more than half of all the palm oil imported in Europe (61%) was used for biodiesel (51%), heating and electricity (10%), while the remaining 39% was used for food, animal feed and other industrial uses such as cosmetics (Oil World, 2018).

The expanding use of this vegetable oil has generated a great deal of controversy about its environmental and health impacts. The health aspect relates to the consumers' apprehension about the concentration of saturated fat, while the ecological debate focuses on the extent to which palm oil expansion causes deforestation and is able to support biodiversity (Disdier et al., 2013). The consequence of these concerns is a greater consumer attention towards palm oil free products and palm oil products that are produced without harm to the environment and society.

Companies developed different strategies to answer both consumers' concern and social organizations' environmental complaints. Some companies replaced the palm oil with other oils in their products and, contextually, introduced the claim "palm oil free" on the product packaging; others decided to use sustainable (i.e. cultivated respecting the environment and local communities) and secure (i.e. treated paying attention to the quality and safety of both the raw material and the finished product) palm oil and to communicate this choice through the packaging. These opposite strategic alternatives opens the debate on which of them best meets the market demands: do consumers prefer "palm oil free" or "with sustainable palm oil" products? Moreover, is it beneficial for companies communicating these strategies through the packaging?

Nutrition claims on the packaging are usually used to communicate product characteristics, ingredients and benefits. Many studies have been conducted on their efficacy; most of them investigated the presence/absence of claims (Aschemann-Witzel & Hamm, 2010; Faulkner et al., 2014; Gorton et al., 2010; Saba et al., 2010; Wansink & Chandon, 2006), the specificity *vs* genericity of the message (Andrews et al., 2013; Garretson & Burton, 2000; Tan & Tan, 2007), the message type ("free from" or "reach in") (Liaukonyte et al., 2013), and the message credibility and its impact on the producer/brand reliability (Keller et al., 1997; Kozup et al., 2003; Garretson & Burton, 2000). Conversely, the issue of communicating the presence/absence of palm oil among the product ingredients has been overlooked despite the numerous researches regarding the environmental and health impact of palm oil (e.g. Fitzherbert et al., 2008; Hansen et al., 2015; Koh & Wilcove, 2008; Lee et al., 2014; Obidzinski et al., 2012; Saswattecha et al., 2015). This study aims to fill this knowledge gap focusing on the health concerns and exploring the effect of different nutrition claims (i.e. "palm oil free" and "with sustainable palm oil") on consumers' attitude and perception toward the product. Starting from the empirical evidence on the role of nutrition claims on the consumer decision-making process, it is hypothesized that the "palm oil free" claim brings to a better attitude, a higher evaluation and a lower risk perception toward the product, compared to (a) the "with sustainable palm oil" claim and to (b) the absence of the claim on the product

packaging. The widespread consumers' concern about the health damage of palm oil should drive a better response to "free from" labelled products compared to (a) "with sustainable palm oil" labelled products and (b) products without claim. More formally, the following hypotheses are proposed:

H1: Exposure to "palm oil free" claim will lead to a more favourable product evaluation than exposure to (a) "with sustainable palm oil" claim and (b) no claim.

H2: Exposure to "palm oil free" claim will lead to a more favourable attitude toward the product than exposure to (a) "with sustainable palm oil" claim and (b) no claim.

H3: Exposure to "palm oil free" claim will lead to a lower risk perception toward the product than exposure to (a) "with sustainable palm oil" claim and (b) no claim.

Perceived tastiness is another important attribute that consumers consider in the product evaluation process. In the food sector, it is widely assumed that the savour of the product influences buying decisions. Literature reported that consumers are not willing to compromise it for health in functional foods (Verbeke, 2005) and some studies highlighted that health claims have a negative impact on the perception of product attributes, such as flavour (Lähteenmäki et al., 2010; Raghunathan et al., 2006). This is due to an expectation of negative changes in sensory properties when the product healthiness is improved, for example, by reducing fat. The body of knowledge on consumer taste expectations has been constructed with reference to both the increase (e.g., addition of fibres) and decrease (e.g., less salt, less fat) of the amount of an ingredient in the product recipe. The proposed study intends to enrich the academic debate investigating the consumer's response when an ingredient is totally eliminated and replaced with another one. In this case, the taste expectation and sensory properties should not be compromised as palm oil is replaced by a fat with equivalent properties. Therefore, it is assumed that the "free from" claim will not generate a lower expected tastiness of the product, compared to the "sustainable" claim and to the "no claim" condition. More formally, the following hypothesis is stated:

H4: Exposure to "palm oil free" claim will not lead to a lower expected tastiness of the product than exposure to (a) "with sustainable palm oil" claim and (b) no claim.

Finally, differences in consumers' willingness to pay between the three claim conditions were investigated. Findings from Bateman et al. (2010) showed that individuals are willing to pay a significant premium price for products using tigers-friendly palm oil (grown in a manner that reduces impacts on such species). However, they limited their analysis to the comparison between sustainable and non-sustainable palm oil, neglecting to explore the "palm oil free" alternative. Hartmann et al. (2018), on their part, compared the "palm oil free" claim towards the absence of the claim (founding a difference in terms of

willingness to pay), but they did not consider the "with sustainable palm oil" alternative. The proposed study intends to enrich such results evaluating the "free from" claim against the "sustainable" claim. If the most pressing consumers' concern refers to the healthiness of palm oil, the environmental sustainability certification is not enough to resolve the apprehension. By contrast, if the "palm oil free" claim is perceived as synonymous with greater healthiness, consumers may be willing to pay a higher price for "palm oil free" products, compared to "with sustainable palm oil" products and to products without claim. Therefore, the following hypothesis is proposed:

H5: Exposure to "palm oil free" claim will lead to a higher willingness to pay for the product than exposure to (a) "with sustainable palm oil" claim and (b) no claim.

Method

The stimulus used in the study was a biscuit packaging. Three versions of the pack were created, one for each experimental condition ("palm oil free" claim, "with sustainable palm oil" claim, "no claim"). Moreover, two types of brand were considered: a well-known brand and a fictional brand. Given that the subjects could already be familiar with the well-known brand and have an established preference, the fictional brand that subjects had not been exposed to before was used in order to reduce potential bias due to this familiarity.

In the well-known brand original packaging design, the "palm oil free" claim appeared (first experimental condition). The image was manipulated to substitute this claim with the "with sustainable palm oil" version (second experimental condition) and to remove it (third experimental condition). Following the same procedure, three similar versions of package design were created for the fictional brand product. In synthesis, six images were used as experimental stimuli and a 3×2 between subjects factorial design was conducted to manipulate the type of claim (free from claim, sustainable claim and no claim) and the brand (well-known and fictional).

A self-administered questionnaire was sent in electronic form to a sample of Italian people. The link to the questionnaire was post on several social network pages and 191 individuals completed it. Respondents were equally and randomly distributed among the six conditions. After viewing the image, they filled in the questionnaire.

The items used to measure the latent variables were drawn from scales that have been well validated in the literature (see Appendix A). Three sets of seven-point bipolar adjective scales (Muehling et al., 1991) were used as measure of attitude toward the product (ATT). The four-items scale developed by Keh and Pang (2010) was used to measure risk perception (RP). Product evaluation (PE) was assessed through a reduced version of the Meyers-Levy and Tybout (1989) scale. The single-item scale proposed by Raghunathan et al. (2006) was used to measure the expected tastiness (ET) of the product. Finally, willingness to pay (WTP) was collected asking participants the price of the product that they considered suitable.

To test the hypotheses, five two-way independent factorial ANOVA were carried out using the SPSS v.25 software. Factorial ANOVA allows to examine interaction effects (more than just main effects) among the variables. While one-way ANOVA just tests the main effect of an independent variable on the dependent one, factorial ANOVA also tests if the effect of the independent variable on the dependent one is the same across all the levels of another independent variable.

Results

Results of factorial ANOVAs are reported in Table 1. The main effect of type of claim on product evaluation was significant ($F = 4.40$; $p < 0.05$). Specifically, post hoc tests showed that the mean score was higher when consumers were exposed to "palm oil free" claim (PE = 21.60) as opposed to "with sustainable palm oil" claim (PE = 18.55), thus supporting H1a. On the contrary, no significant difference emerged with respect to the "no claim" condition (H1b). The type of claim also impacted on risk perception ($F = 5.87$; $p < 0.01$), supporting H3. Consumers exposed to the "palm oil free" claim showed a lower risk perception toward the product (PR = 7.12) compared to those exposed to the "with sustainable palm oil" claim (PR = 9.97) and to the "no claim" packaging (PR = 7.20). As hypothesized in H4, the "free from" claim did not generate a lower expected tastiness of the product, compared to the "sustainable" claim and to the "no claim" ($F = 1.02$; $p > 0.05$). Finally, H2 and H5 were not supported by empirical data as attitude and willingness to pay did not differ among the three experimental conditions. Results indicated the absence of an interaction effect between brand and claim for each dependent variable, thus excluding the potential familiarity with the well-known brand bias. The ~~cell~~ means and standard deviations of the independent variables are shown in Table 2 and 3.

-- Insert table 1 here –

-- Insert table 2 here –

-- Insert table 3 here –

Discussion and Implication

In the last decades, consumers have shown a growing concern about the environmental and health impact of palm oil production and consumption. As a consequence, companies developed different strategies to reassure them and to meet the market needs. Understanding how individuals respond to these strategies is of crucial importance, especially in the food sector. This paper investigated the consumers' response toward product packs showing different palm oil-related claims: "palm oil free", "with sustainable palm oil" and "no claim". Results revealed that the risk perception was lower in the case of "palm oil free" labelled products compared to "with sustainable palm oil" labelled products and to

products without claim. A second key finding is that the "palm oil free" product received a better evaluation compared to the "with sustainable palm oil" product. Finally, as expected, perceived tastiness was equal among the different experimental stimuli. Such evidence enriches the literature on consumer taste expectations and provides manufacturers with a powerful weapon to influence the consumers' decision making process. The observed effects did not differ across brands, thus excluding possible biases related to the knowledge of and the relationship with the brand.

Shifting the attention from environmental and health questions, the proposed study focuses on consumers' perception of palm oil. Moreover, it provides both theoretical and managerial contributions to the research on the marketing role of nutritional claims. Companies put forth significant efforts through design and content revisions of claims on pre-packaged foods to help consumers make easier and better choices. Results confirmed the importance of nutritional claims as a source of information and their ability to shape consumers' evaluation of food products. The strategy to replace the palm oil with other fats seems to be preferred by the market. This is an interesting hint for manufacturers wishing to launch a new product on the market as well as for those that simply intend to revise their recipes to better meet the demand's needs. Fear of possible damage to health induces consumers to prefer products with the "palm oil free" claim, which are better evaluated and considered less risky and as tasty as those with palm oil. To silence the risk of health damage attributed to palm oil, manufacturers can simply replace this fat with an equivalent one without fearing any change in the product taste perception. On the contrary, the companies' sustainability commitment does not seem to be enough to reassure consumers about the use of palm oil in food production. Since "sustainable" means "beneficial for the environment and populations", and not for the health, people continue to perceive the health risk of palm oil and prefer its removal from the product recipe. Thus, the communication activity that some companies carried out so far seems not sufficient to reassure consumers. Saying, for example, that "the palm oil used in this product is secure and of excellent quality" does not automatically translate in "not harmful to health". If, from an environmental management standpoint, it is important to encourage the adoption of voluntary or mandatory sustainability standards and certifications, the approach towards the consumer must necessarily focus on communication strategies and increasing information. Messages through different media need to be improved, emphasizing, for example, that no scientifically proven negative health effect can be attributed to palm oil consumption. If the right marketing efforts are pursued, consumers could better evaluate properties and safety of quality palm oil and make more conscious choices. Therefore, information and education appear as the most appropriate levers for easing customers' concern and influence their buying choices.

This study provides an important starting point for future research. First, the effect of different types of textual information on the dependent variables should be considered. In particular, different claims that communicate the use of sustainable palm oil or its health safety should be analysed. Second, further studies are needed to determine whether these findings could be generalized to other product categories. Third, it would be interesting to measure the perceived tastiness, instead of the expected tastiness, through a tasting test. Finally, the actual purchasing behaviour of consumers with respect to the different experimental stimuli should be explored.

-- Insert Appendix A here –

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Table 1 - Main and interaction effects of the type of claim and the type of brand on the independent variables

	Product evaluation		**Attitude tw the product**		**Risk perception**		**Expected tastiness**		**Willingness to pay**	
	F	*Sign.*	*F*	*Sign.*	*F*	*Sign.*	*F*	*Sign.*	*F*	*Sign.*
Claim	4.399	*0.014*	1.235	*0.293*	5.873	*0.003*	1.015	*0.364*	2.754	*0.066*
Brand	7.273	*0.008*	0.041	*0.839*	17.120	*0.000*	1.357	*0.245*	6.812	*0.010*
Claim * Brand	2.230	*0.110*	2.991	*0.053*	1.063	*0.347*	1.776	*0.172*	1.599	*0.205*

Table 2 - Means and standard deviations of the independent variables*

	"Palm oil free" claim		**"With sustainable palm oil" claim**		**No claim**	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
Product evaluation	21.60	*5.755*	18.55	*6.688*	19.21	*6.885*
Attitude towards the product	10.66	*3.726*	11.82	*4.363*	11.00	*4.129*
Risk perception	7.12	*4.574*	9.97	*6.792*	7.20	*4.681*
Expected tastiness	4.25	*1.581*	3.92	*1.650*	3.89	*1.693*
Willingness to pay	1.79	*0.697*	1.62	*1.056*	1.46	*0.751*

* Without distinction by brand

Table 3 - Means and standard deviations of the independent variables by brand

	"Palm oil free" claim		**"With sustainable palm oil" claim**		**No claim**	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
Well-known brand						
Product evaluation	22.55	*4.999*	18.80	*6.703*	21.60	*6.647*
Attitude towards the product	11.52	*3.641*	11.73	*4.571*	10.14	*4.306*
Risk perception	6.29	*2.466*	8.13	*6.279*	5.29	*2.334*
Expected tastiness	4.19	*1.579*	3.93	*1.760*	4.31	*1.891*
Willingness to pay	1.92	*0.729*	1.92	*1.281*	1.49	*0.607*
Fictional brand						
Product evaluation	20.74	*6.316*	18.30	*6.778*	16.52	*6.201*
Attitude towards the product	9.88	*3.683*	11.90	*4.221*	11.97	*3.755*
Risk perception	7.88	*5.814*	11.80	*6.890*	9.35	*5.678*
Expected tastiness	4.29	*1.605*	3.90	*1.561*	3.42	*1.311*
Willingness to pay	1.66	*0.651*	1.32	*0.665*	1.415	*0.895*

Appendix A. Measurement scales and reliability indices*

Scale	Items	Cronbach's Alpha
Attitude toward the product *(Muehling et al., 1991)*	Good-Bad Favourable-Unfavourable Negative-Positive	0.91
Risk Perception *(Keh & Pang, 2010)*	The thought of using this product made me feel psychologically uncomfortable The thought of using this product gave me a feeling of unwanted anxiety The thought of using this product caused me to experience unnecessary tension I would worry a lot when buying this product	0.92
Product Evaluation *(Meyers-Levy & Tybout, 1989)*	Appeal – not appeal Satisfying – not satisfying Desirable – Undesirable Good quality – Bad quality	0.91
Expected Tastiness *(Raghunathan et al., 2006)*	I'm interest in trial - I'm not interest in trial Not at all tasty – Very tasty	

* All statements were on a seven-point bipolar or anchored scale