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## Is Vegan Confectionary Sold in the United Kingdom Safe for Milk Allergy Sufferers?

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*South Dakota State University*

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IS VEGAN CONFECTIONERY SOLD IN THE UNITED KINGDOM SAFE FOR  
MILK ALLERGY SUFFERERS?

BY FAYE HARRISON

A thesis submitted in partial fulfillment of the requirements for

Master of Science in Dietetics

South Dakota State University

2020

## THESIS ACCEPTANCE PAGE

Faye Candice Harrison

This thesis is approved as a creditable and independent investigation by a candidate for the master's degree and is acceptable for meeting the thesis requirements for this degree.

Acceptance of this does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Kendra Kattelmann  
Advisor

Date

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Department Head

Date

Nicole Lounsbery, PhD  
Director, Graduate School

Date

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## ABSTRACT

### IS VEGAN CONFECTIONERY SOLD IN THE UNITED KINGDOM SAFE FOR MILK ALLERGY SUFFERERS?

FAYE HARRISON

2020

#### **Background**

Milk allergy is the most common childhood allergy. Reading food labels is important to prevent an allergic reaction. By United Kingdom (UK) law, milk needs to be listed on the food label if it used as an ingredient. Products can be called ‘free from’ milk if manufacturers have undergone rigorous process and testing to ensure it is not contaminated with milk. Precautionary Allergen Labelling (PAL) like ‘may contain milk’ statements are unregulated and can be used at manufacturer’s discretion. Similarly, ‘Vegan’ products are not regulated by law and appear to be on the increase.

#### **Objective**

The study aimed to assess the suitability of vegan confectionery sold online in the UK for cow’s milk allergy sufferers by analyzing the food labels and their reference to milk. The secondary aim was to verify the online food labels with those instore.

#### **Method**

The food labels of vegan confectionery from the top 4 groceries stores in the UK were analyzed online for milk listed as an ingredient; PAL for milk; listed as ‘free from’ milk and no reference to milk on the food label. The food labels from a 10% subsample were verified with instore labels. Exact multinomial tests were used for the significance

cow's milk labelling while the exact binomial test was used at a 95% confidence interval to verify online food labels instore.

### **Results**

Vegan confectionery (n=143) products analyzed online were deemed not suitable for cow's milk allergy sufferers (p=0) as 20.3% had PAL for milk; 27.3% made no reference to cow's milk; and 52.5% were labelled as 'free from' milk. When verified in store a significant number of products (n=3) did not match the online food label (p<0.05).

### **Conclusion**

Vegan confectionery sold in the United Kingdom is not necessarily suitable for cow's milk allergy sufferers. Patients should read individual food labels prior to consumption to assess product suitability as food labels may change.

## INTRODUCTION

Food allergies appear to be on the increase around the world with cow's milk allergy being the most common allergy in young children (Prescott et al., 2013). At age 1, the prevalence of cow's milk allergy is thought to be 0.5-3% in developed countries (Flom JD and Sicherer, 2019).

Cow's milk allergy usually presents in early childhood and may be Immunoglobulin-E (IgE) mediated or non-IgE mediated (Luyt et al., 2014). Symptoms in non-IgE mediated allergies are usually non-specific and occur after 2 hours to 3 days following cow's milk ingestion and include: eczema exacerbation, colic, reflux, diarrhea, constipation, proctocolitis as well as growth failure. Non-IgE milk allergy is usually mild to moderate and does not pose the risk of life-threatening anaphylaxis (Venter, 2013). Due to the non-specific nature of symptoms, a complete milk exclusion diet for at least 4 weeks which should resolve symptoms, followed by milk reintroduction triggering symptoms, is needed for diagnosis. The authors of the iMAP milk ladder, an international guideline of non-IgE cow's milk allergy management, recommend an initial cow's milk exclusion diet for around 6 months, followed by graded-home introduction of cow's milk as symptoms allow (Venter et al., 2017). While non-IgE milk allergy does not trigger a life threatening reaction, low grade milk allergen exposure, as in the case of poor compliance to a milk-free diet, has been linked to a raised inflammatory response. This increase in inflammation has in turn been proposed as a contributing factor to growth failure seen in milk-allergic children (Isolauri et al., 1998; Majamma et al., 1996).



In contrast to non-IgE milk allergy, IgE mediated cow's milk allergy, occurs within two hours of ingestion and can include symptoms of life-threatening anaphylaxis. Cow's milk has been shown to be one of the biggest triggers of anaphylaxis (Grabhenrich et al., 2016). Other symptoms of Ig-E mediated cow's milk allergy include angioedema, urticaria, gastrointestinal symptoms such as abdominal pain and diarrhea, vomiting, coughing, wheezing and cardiovascular symptoms (Sicherer et al., 2018). The gold standard for diagnosing an IgE mediated cow's milk allergy is the double-blind placebo-controlled food challenge, where the allergen as well as a sensory-identical placebo food is fed to the patient, ideally on separate days. Should the allergen-containing food, but not the placebo illicit a reaction, the patient is deemed allergic (Sampson et al., 2012). An allergy focused history as well as allergy tests such a specific IgE's and skin prick tests are also useful and can help to diagnose cow's milk allergy, although reliance on the latter two tests can lead to an over diagnosis of milk allergy (Muraro et al., 2014; Gomes-Belo et al., 2018).

The management of food allergies, including cow's milk allergy, involves allergen avoidance, until such time that an allergen is outgrown and can be reintroduced into the diet under the supervision of the specialist allergy team (Sampson et al., 2012; Venter et al., 2017). Reading and interpreting food labels is crucial to milk allergy management and minimising the risk of an allergic reaction. Reading food labels needs to become a routine task as food allergic patients should not rely on previously consumed products as manufacturing methods and subsequently food labels change (Groetch and Nowak-Wegrzyn, 2013). Food allergen labelling differs around the world, however the European Union (EU), of which the United Kingdom (UK) is currently a member, requires 14 major allergens to be labelled clearly in bold or italic font which increases

food safety for food allergy sufferers. The 14 major allergens that are required to be listed as an ingredient are: gluten, peanut, tree nuts, sesame, shellfish, molluscs, crustaceans, fish, milk, egg, soya, celery, mustard and lupin. The food label further needs to clarify the source of the ingredient derivatives, for example casein should have '*milk*' in parenthesis and ovalbumin should be labelled as '*egg*' (Gendel, 2012; Soon and Manning, 2017).

Conversely, manufacturers may use the term 'free-from' on the food label if manufacturers are certain their product does not contain any traces of the allergen (FDF, 2015). According to the UK's Food and Drink Federation, the absolute claim that a product is 'free from' an allergen should only be used if: the product does not have the allergen as an ingredient; the product is made in an environment with strict Good Manufacturing Procedures to prevent cross-contamination with the named allergen; and routine sampling and testing is carried out to ensure the product does not contain traces of the named allergen. Lastly, the method of communicating the free from status of the product should comply with the law. Only gluten is regulated by law with regards to absolute quantities allowed in a 'free-from' product which may be present in gluten-free products in quantities not exceeding 20mg/kg (FSA, 2017).

What is less well defined is the use of precautionary allergy labelling (PAL). The use of terms such as 'may contain milk', 'made in a factory that uses milk', 'not suitable for milk allergy sufferers' are not standardised or required by law in the EU. Manufacturers can put these warnings on labels or omit them based entirely on their own discretion (Zurzolo et al., 2016). PAL should indicate a level of risk to the

consumer as it has the potential to contain the named allergen. An allergen can inadvertently be incorporated into a product at any stage of the food chain, including during shared transportation or storage. The most common cause of contamination being due to the use of shared manufacturing equipment (FSA, 2017). Food residue, containing an allergen, may be present on factory equipment or surfaces leading to cross-contamination of products not intended to contain the allergen. Good manufacturing practices including manufacturing scheduling of allergens as well as thorough cleaning are recommended but still may not be sufficient to prevent cross contamination of a product (Boye and Godefroy, 2010).

PAL statements can be frustrating for allergy sufferers as the likelihood of the product containing the declared allergen is not known, while the use of PAL statements is abundant. The UK Food Standards Agency (2002) showed that 69% of cereals and 56% of confectionery were labelled with a PAL for nuts. When tested in a laboratory, 4.5-10.9% of products with 'may contain peanut' warnings contained peanut (Zurzolo et al., 2016, Pele et al., 2006). With regards to milk, 10.2% of products tested in New York with a PAL to milk contained detectable quantities, namely 0.13-7.3 mg, of milk per serving while those without PAL statements were not exempt from containing detectable traces (Ford et al., 2010). In another American study conducted in Nebraska, 45 (30.6%) of products with PAL statements to milk contained between 0.027-2400 mg of milk per serving, with dark chocolate being the most common offending food (Crotty and Taylor, 2010).

In a 2018 study looking at unexpected reactions to food in 153 adults, milk was the most frequently found allergen in culprit foods. Fifty percent of foods containing traces of milk were thought to pose a high or very high risk (greater than 40% chance) of triggering a reaction in milk allergic population. Chocolate contained the highest concentration of milk namely 4388ppm (4388mg per kilogram of food). Less than 40% of the products that contained traces of milk had a precautionary allergen label warning for milk (Blom et al., 2018). Similar findings were expressed by Spanjersberg et al. (2009) where undeclared traces of milk were found in products, particularly chocolate, in quantities that would cause a reaction in over 60% of the milk allergic population.

Over 80% of healthcare providers thought that PAL statements increased patient anxiety (Turner et al., 2016). While reading food labels is a time-consuming process and those looking for PAL warnings spent 39% more time reading the food label (FSA, 2002). Having foods that are assured to be free from allergens could potentially save patients with these allergies both time and reduce worry over such foods.

### Vegan diets

Vegan products also lack regulation when it comes to food labels and little is known about food labels in this food group (Purnhagen and Schebesta, 2019). However, there is a requirement that labelling of foods should not be misleading (FSA, 2017). While the UK's National Health Service (2018) defines a vegan diet as one which excludes animal products there is no legal requirement to label foods as vegan nor is there a requirement for vegan products to be free from animal products such as cow's milk (Purnhagen and Schebesta, 2019).

Despite the lack of regulation, vegan products appear to be on the rise with Greggs, a popular sandwich shop and baker, offering a vegan sausage roll and recently expanding their vegan range (Smithers, 2020). Similarly, popular ice-cream manufacturer Ben & Jerry's has launched a range of vegan ice creams (Stern, 2020). While the non-profit organisation Veganuary, which encourages the public to give up animal products for the month of January and thereafter, reported a 4-fold increase in veganism around the world (Veganuary, 2020). Google trends indicates a steady increase in the search term 'vegan' over the last 5 years in the United Kingdom, with a spike in the trend during the month of January (Google, 2020). There is an apparent increase in interest in veganism and subsequent vegan products.

There is both an increase in cow's milk allergy and vegan products, however what is yet unstudied is the suitability of vegan foods for milk allergies sufferers. If followed by definition, vegan foods should be free from all animal products including milk. However, the labelling of vegan foods remains unregulated in the United Kingdom and therefore may well contain milk as an ingredient or trace amounts of milk resulting in the presence or absence of a PAL statement. Vegan products have been recalled previously due to the presence of milk or due to undeclared milk contamination risk (FSA, 2020; FSA, 2019). Vegan foods could lead allergy sufferers into a false sense of security by assuming they are free from animal products including cow's milk, putting them at risk of a potentially life-threatening reaction should they consume such foods without scrutinising the food label first.

## Significance

There is a great need to assess vegan foods' suitability for cow's milk allergy sufferers, particularly confectionary such as chocolate candy, cookies and cake which has shown to be contaminated with milk in the past (Ford et al., 2010; Crotty and Taylor, 2010; Blom et al. 2018). Should vegan foods be suitable for cow's milk allergy sufferers by being labelled 'free from' milk, it would increase food products available to them. Should vegan products either contain milk as an ingredient or contain traces of milk, these products could lead to a potentially life-threatening reaction in milk allergy sufferers, who may assume a vegan product is suitable for their consumption. The information obtained from this study can not only be used by allergy healthcare professionals to advise cow's milk allergy patients on food consumption, but it can be used by law makers in assessing the need to regulate vegan food labels.

## AIM AND OBJECTIVE

The aim of the study was to determine if vegan confectionary sold at grocery stores in the United Kingdom is safe for cow's milk allergy sufferers by assessing the food labels and their reference to cow's milk online.

The secondary objective is to determine if information on food labels regarding cow's milk online is comparable to cow's milk reference of the same physical product food label.

## METHODS

A quantitative cross-sectional study was carried out between the 2<sup>nd</sup> and 11<sup>th</sup> of August 2020 online and in 4 grocery stores in the UK, namely Tesco, Sainsbury's, ASDA and Morrisons which have approximately 75% of the United Kingdom's grocery store market share (Statista, 2020). Initially, the websites of these 4 grocery stores were investigated for vegan confectionary by typing 'vegan' into the search bar on each website. The results were filtered manually to identify vegan confectionary in the following categories: chocolate candy, non-chocolate candy, ice-cream alternatives and baked confectionary. The product description and online food label was then analyzed to determine if the products: 1) contain cow's milk as an ingredient; 2) have a Precautionary Allergen Label for cow's milk; 3) were labelled as free from cow's milk; or 4) Make no reference to cow's milk.

A random 10% sample, weighted by each candy category, was verified in person by a physical visit to each grocery store within in 7 days of the online assessment. The percentage of products that was verified was rounded up to the nearest percentage in the case of odd numbers. The random sample was generated in Microsoft Excel using the RANDBETWEEN function. The lowest numbers generated giving a 10% sample (rounded up to the nearest percent) were used for in person inspections in the grocery store.

### Inclusion and exclusion criteria

Only vegan confectionary products that were labeled as ‘vegan’ were included. Those that for example were labelled ‘plant-based’ without saying they are vegan were excluded. In addition, the duplicates of identical products that occurred at more than one grocery store were excluded in the analysis, with the exception of one duplicate product which had different allergen labelling at the subsequent grocery store. In this case the duplicate product was kept in the analysis.

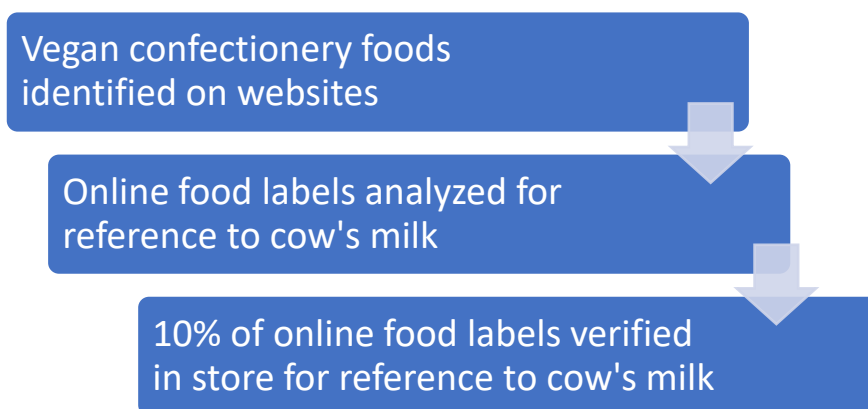


Figure 1: Summary of the data collection process

### Ethics

The protocol for this study was submitted to the Institutional Review Board of South Dakota State University, prior to commencing the study and was deemed exempt.

### Statistics

The statistics for this study were performed using R version 4.0.2 with the EMT package. Exact multinomial tests were performed to determine the significance in the frequency of free from cow’s milk labelling and PAL labelling in the sample overall as well as in candy categories. To determine if the difference between the in online grocery



store labels and the instore products labels was significant the exact binomial test was used at a 95% confidence interval.

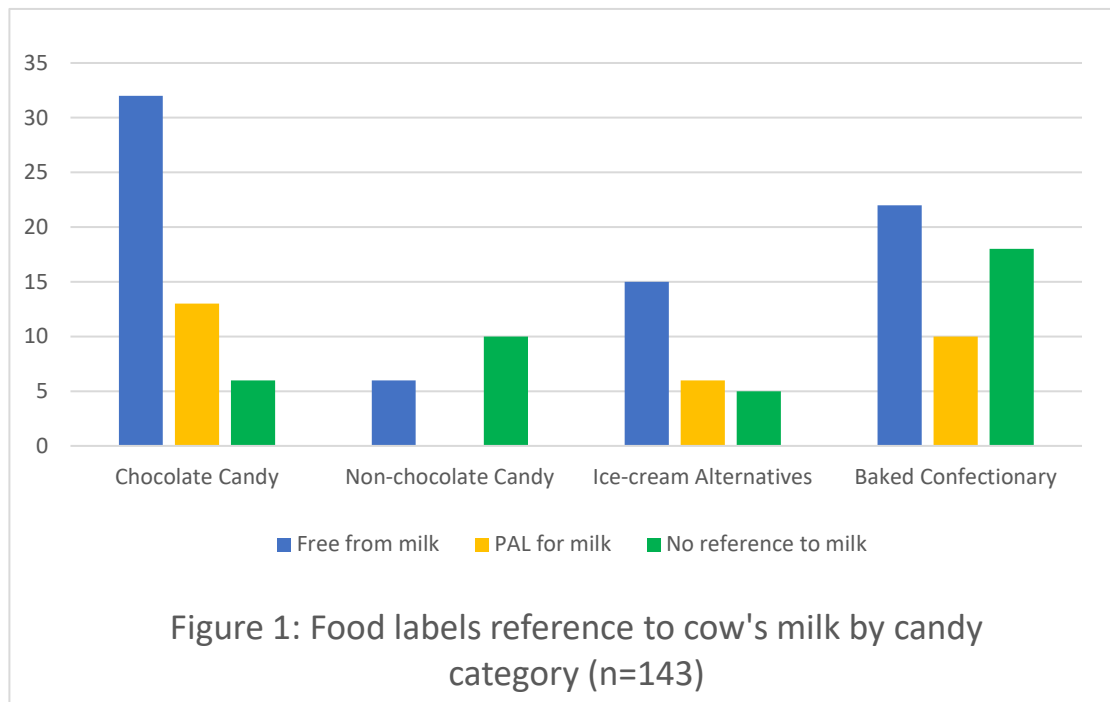
## RESULTS

### Analysis of online food labels

After assessing the websites of Tesco's, Sainsbury's, ASDA and Morrison's for vegan confectionery, 143 products were included and the food label assessed for reference to cow's milk. No products assessed contained cow's milk as an ingredient. The frequency and percentages of precautionary allergen labelling, free from cow's milk labelling and no reference to cow's milk on the food label can be found in Table 1.

Table 1: Results from Online Vegan Confectionery Food labels and their Reference to Cow's Milk

	<b>Precautionary allergen labelling (%)</b>	<b>Free from cow's milk labelling (%)</b>	<b>No reference to cow's milk on labelling (%)</b>	<b>Total (%)</b>
Chocolate Candy (n=51)	13 (25.5%)	32 (62.8%)	6 (11.8%)	51 (100%)
Non-Chocolate Candy (n=16)	0 (0%)	6 (37.5%)	10 (62.5%)	16 (100%)
Ice Cream Alternatives (n=26)	6 (23.1%)	15 (57.7%)	5 (19.2%)	26 (100%)
Baked Confectionery (n=50)	10 (20.0%)	22 (44%)	18 (36%)	50 (100%)
<b>Total (n =143)</b>	<b>29 (20.3%)</b>	<b>75 (52.5%)</b>	<b>39 (27.3%)</b>	<b>143</b>



### Statistical Significance of online label findings

The null and alternative hypothesis was stated as:

$$H_0: (\Theta_1, \Theta_2, \Theta_3) = (1, 0, 0)$$

$$H_A: (\Theta_1, \Theta_2, \Theta_3) \neq (1, 0, 0)$$

Where  $\Theta_1$  = free from cow's milk labels,  $\Theta_2$  = PAL for milk statement,  $\Theta_3$  = no reference to cow's milk

Using the exact multinomial test, the p-value for all the whole sample and each candy category was 0, therefore the null hypothesis was rejected and the alternative hypothesis accepted, indicating vegan confectionery products are not suitable for milk allergy sufferers.

### Verification of online labels in store

Online food labels were assessed for accuracy by assessing 11.2% of online labels in store. The results (as seen in Table 2.) show that 13 of 16 or 81.25% of labels seen online were the same in store with reference to cow's milk.

Table 2: 11.2% of online samples verified in person for reference to cow's milk

	<b>In person labels match online labels</b>	<b>In person labels differ from online labels</b>	<b>Total</b>
Chocolate Candy (n=6)	5	1	6
Non-Chocolate Candy (n=2)	2	0	2
Ice Cream Alternatives (n=3)	3	0	3
Baked Confectionery (n=5)	3	2	5
<b>Total</b>	<b>13 (81.25%)</b>	<b>3 (18.75%)</b>	<b>16</b>

### Statistical significance of the verification of online labels in store

The null and alternative hypothesis was stated as:

$$H_0: \Theta = 1$$

$$H_A: \Theta < 1$$

Where  $\Theta$  is the number of grocery store food labels that match the online food labels



Using the exact binomial test at 95% confidence interval  $p < 0.05$  indicating we can reject the null hypothesis and conclude that instore food labels are significantly different from those on the actual product in store.

## DISCUSSION

This study aimed to determine if vegan confectionary sold at grocery stores in the United Kingdom is safe for cow's milk allergy sufferers by assessing the food labels for reference to cow's milk. We found that no confectionary labelled as vegan had milk listed as an actual ingredient. This was not unexpected, as by definition vegan foods should not contain any animal products, despite vegan products being recalled in the past due to the presence of milk (FSA, 2020; FSA, 2019; NHS, 2018).

### Precautionary Allergen Labelling (PAL) for milk

Just over 20% of the sample displayed precautionary allergen labelling for milk on the online label. This is a similar finding to a 2009 study assessing the frequency of PAL statements in manufactured products, which showed that a PAL statement for milk was present in just over 25% of the samples (Pieretti, et al. 2009). Chocolate candy and cookies had the highest overall frequency of PAL statements in the 2009 study, with the former reflected in our sample which found the highest frequency of PAL statement for milk. Our sample had a 9% lower PAL frequency for milk than a 2018 Netherlands study, however the Netherlands' study only analyzed products to which patients reported an unexpected reaction, which may have introduced bias in PAL findings (Blom, et al. 2018).

Chocolate candy, baked confectionery and ice cream alternatives all showed a frequency of PAL for milk of at least 20% while non chocolate candy had no PAL statements for milk. In the case of chocolate, baked goods and ice cream alternatives. this higher PAL for milk frequency may be due to similar non vegan milk-containing food products being produced on the same manufacturing equipment as the vegan alternatives, as this has been cited as a frequent introduction of allergen traces (FSA, 2017; Boye and Godefroy, 2010). For example, milk chocolate may be produced using shared equipment with vegan chocolate and vegan ice cream may use the same equipment as regular dairy ice cream. Milk and other dairy products like butter and cream are further common ingredients in non-vegan confectionery like cakes and cookies. If shared with vegan products, equipment used in milk containing foods could introduce traces of milk in an otherwise vegan product, despite cleaning between

batches (FSA, 2017; Boye and Godefroy, 2010). The cleaning of equipment used in chocolate manufacturing is known to be particularly challenging and has been attributed to the high risk of milk contamination seen in dark chocolate previously (Crotty and Taylor, 2010). Non chocolate candy such as gelatine-containing sweets, on the other hand, may not commonly use milk as an ingredient in such candies which might be why no products were found to contain a PAL for milk.

Despite being labelled as vegan, the frequency of PAL for milk is similar to that of regular non vegan confectionery. This indicates that vegan labelled confectionary, if assessed by their food label, is not any better suited to cow's milk allergy sufferers than regular confectionery. No studies have specifically analyzed vegan products in a laboratory to determine if traces of milk can be detected. Such a study is recommended. When assessed in the laboratory, previous studies show that the presence of trace allergens found in products with PAL has been inconsistent and consumers express frustration over the seemingly high number of products with PAL statements (Crotty and Taylor, 2010; Ford et al., 2010; Barnett, et al. 2011).

Standardization and legal limits on when a product should be labelled with PAL is needed as the use of PAL is currently at UK manufacturers' discretion. The Vital 2.0 group in Australia has developed guidance to recommend maximum thresholds in which a product should not exceed, for the major allergens including cow's milk, based on the eliciting dose of each allergen. The eliciting dose is the quantity of allergen that needs to be ingested to cause a reaction in the allergic population. For cow's milk, the quantity of protein that needs to be ingested to cause a reaction in 1%

of the most sensitive cow's milk allergic population is 0.1mg (this is known as ED<sub>01</sub>). The group suggested that a PAL statement for milk should only be used if it contains more than the ED<sub>01</sub>, making it unlikely to cause a reaction in 99% of the milk allergic population. The remaining 1% of the most sensitive milk allergic population would need to receive additional dietary and treatment management counselling (Allen, et al. 2014).

#### 'Free From' cow's milk

Over half the vegan confectionary products assessed in this study were labelled as 'free from' cow's milk. Chocolate and ice -cream alternatives had the highest percentage of products labelled as 'free from' milk, at 62.8% and 57.7% respectively. Consumers have previously expressed a demand for 'free from' products (Barnett, et al. 2011). It is this demand for 'free from' products that may have resulted in the high frequencies of milk free confectionary found in our study. The fact that the confectionary in our sample were also vegan, may also have contributed to the high frequency of 'free from' cow's milk seen. Although not assessed in this study, we cannot rule out that manufacturers who made some of the vegan confectionary products analyzed in our study, may only produce vegan products with no handling of cow's milk in their factories or equipment, making contamination with cow's milk improbable.

According to the UK's Food and Drink Federation (2017), manufacturers should only use the term 'free from' if rigorous procedures including Good Manufacturing Procedures to prevent cross-contamination and routine sampling and testing is undertaken to confirm the absence of the allergen in question. Currently, only gluten

is regulated by law with regards to the absolute quantities of gluten allowed in a product labelled as 'free from gluten' which is 20ppm (FSA, 2017).

Foods labelled as 'free from' an allergen are generally trusted by consumers and consumers have expressed a desire for more products in this category (Barnett, et al. 2011). With regards to wheat and gluten one study tested 20 snack bars with none of them exceeding the maximum limit of 20ppm (Thompson, et al. 2016). A more recent American study which tested over 300 products listed as 'gluten-free' found that only 4% had gluten levels higher than the FDA required 20ppm (Thompson et al. 2018). No studies assessing products labelled as 'vegan' or 'free from milk' have been published to the author's knowledge.

#### No reference to cow's milk on the food label

Just over 27% of all the vegan confectionery assessed in this study made no reference to cow's milk on the food label. This means that milk was not listed as an actual ingredient, there was no PAL statement for milk, nor was the product specifically labelled as 'free from milk'. The absence of a reference to cow's milk does not translate to definite safety however, as PAL statements for allergens are voluntary (Zurzolo et al., 2016). Manufacturers are not obligated to place PAL statements on products and should only do so if they deem the product has a risk of contamination. When tested in a laboratory, a 2018 study found that just over half of the 19 products tested contained undeclared allergens, 5 of them contained milk, without any PAL statements on the label (Blom, et al., 2018). Further laboratory studies are suggested to determine if undeclared traces of milk are a risk in vegan confectionery products



without PAL statements for milk. Until such studies suggest otherwise, or regulations such as those suggested by Vital where thresholds for cow's milk content are standardized legally, milk allergic consumers need to be educated that the absence of a PAL statement for milk does not negate risk for traces of milk in the product (Allen, et al. 2014). Milk allergy sufferers should keep emergency medication on hand and be prepared to treat an allergic reaction (Mehl, et al. 2005).

#### Verification of online food labels in store

A statistically significant ( $p < 0.05$ ) number of products' ( $n=3$ ) instore food label differed from that was depicted online by the grocery store. While the subsample of products verified instore was small, any discrepancy in food label is significant for cow's milk allergy sufferers if it depicts a change in risk of an allergic reaction. Manufacturing methods may change, and this may be reason for the discrepancy in the online versus in store food labels in 3 of our studied products. However, the verification of online labels instore occurred within a relatively short period of 7 days. Therefore, the more likely explanation for the discrepancy is either a delay in updating the website by the grocery store or an error in input on the website by the grocery store. Nonetheless milk allergy sufferers should be advised to read food labels on every product prior to consumption, even if the product has been eaten previously as food labelling and thus risk of a reaction may change (Groetch and Nowak-Wegrzyn, 2013).

### LIMITATIONS

This study analyzed food labels online rather than in store, with only a small subsample sample verified in store. The online analysis was done for ease of access to

the food labels as locating products exclusively in store may have resulted in missed samples. The study did not analyze every available vegan confectionery product in the United Kingdom, rather only those that were listed online at the top 4 grocery stores which hold the majority of the market share. Lastly the project only analyzed food labels with regards to cow's milk. No laboratory tests were performed to verify the presence or absence of cow's milk in the products.

## CONCLUSIONS AND RECOMMENDATIONS

Vegan confectionery products sold in the UK, when assessed by their food label, are not automatically suitable for cow's milk allergy sufferers. Healthcare professionals and their milk allergic patients need to be educated on reading and assessing vegan confectionery food labels for their reference to cow's milk and thereby their suitability for safe consumption. Patients should be advised that if they purchase food products such as vegan confectionery online, they need to check the physical product food label prior to consumption, as food labelling, and thus suitability, can change.

It is recommended that the terms 'vegan' and 'free from cow's milk' become regulated by law and interchangeable terms. This law should require that the vegan products do not contain traces of cow's milk. In turn this would ensure vegan products are 'free from' cow's milk thus making it suitable for cow's milk allergy sufferers. Legal thresholds for milk allergen content of foods labelled as PAL for milk should be set for clear messaging to the milk allergy consumer. Lastly, further studies are needed to assess the milk content of vegan confectionery in a laboratory and whether the absence or content of milk traces is reflected in the food labelling.

## APPENDIX

### Appendix 1: Confirmation that no further IRB approval was needed for the study

Hello Faye Harrison,

Because your project (Is Vegan Confectionery Safe for Milk Allergy Sufferers?) does not involve human subjects, IRB review and approval is not required.

I wish you the best in your study.

Dianne Nagy

Research Integrity and Compliance Officer

[View Application](#)

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