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Title:

Wheat Flour Fraud;

Mitigation Measures by an Industrial Bakery in Malta.

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Student ITS number: 0219200L

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Abstract

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The aim of this research was discover more regarding mitigation measures adopted by a local baking goods company in order to avoid fallin victim to a food fraud case. Further more the study set to find out more about the risks of food fraud within the food industry which is the largest industry globally.This study is aiming to reach it's goals by using primary and secondary research data gathering. Online literature was found in order to help give a better meaning to the study and afterwards an interview was held with a technical manager from a local company in order to gather primary data and explain more what the situation is in Malta.The findings from this research discovered that food fraud is not something to be taken lightly but is a much bigger problem then expected. As it effects more then 10% of all sold food products.The author suggests that more research should be done in the coming future as there are not many studies regarding the subject of fraud in wheat flour and grains specifically. By the end of the study the author has concluded that large business's such as the pariticipant within this study have been taking food fraud risks very seriously and have done the utmost in order to prevent this by having policies and standards in place, evaluating there supplier and products and laboratory testing there products for safe reassurance.

Keywords
Food fraud, mitigation measures, wheat flour, protein.

Declaration of Authenticity

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Student ITS Number **:** 0219200L

Programme **:** Higher national diploma in food production and preparation operations.

Research Title **:** Wheat flour fraud; Mitigation measures by an industrial bakery in Malta.

Declaration:

I hereby declare that this research study is based on the outcome of my own research. I, as the author, declare that this research study is my own composition which has not been previously produced for any other qualification.
The research study was conducted under the supervision of Mr.Joseph Cassar.

30 September 2022

Date

K. Scicluna

Student's Signature

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Table of Contents

1. Introduction

Humans have been cooking for a long time, and it did not take long to start grinding wheat and other grains to produce bread, considered the most significant staple food around the entire globe. According to Fantozzi (2018), bread was first recorded in history at around 1000B.C in Egypt, where it has evolved into the bread we know today. Bread is made in many different styles and recipes throughout the world and almost every country has its unique type of traditional bread that has usually been around for many years. Most traditional types of bread are made from wheat flour (Goesaert, 2005).

Wheat flour is the powder produced from the grinding of wheat. It is an essential ingredient in bread and other bakery goods. As the main ingredient in these products, flour significantly affects the quality of the final result. Therefore every processing step of wheat flour production needs to be operated thoroughly in order to be able to effectively produce good quality flour (Atwell, 2001). Apart from its consistent and starchy quality, wheat flour also contains many substances such as gluten, non-starch polysaccharides, and lipids, which are essential substances due to their considerable impact on the processability of the raw material and also its impact on the final quality of the product. Of all cereal flour, only wheat flour can form a viscoelastic dough texture when mixed with liquids. The viscoelasticity quality seems to be because of the gluten, which has an affinity for water, which will swell and interact. In addition, wheat flour doughs have a remarkable ability to retain gas. This property appears to result from slow rate gas diffusions in the dough. Another ability of wheat flour in bread is to set when baked at high temperatures and produce high-quality light products. An essential quality feature of wheat flour is the protein component. The higher quality protein means higher quality bread (Hoseney and Rogers, 1990).

Food fraud

The food industry is one of the biggest, if not the biggest, money-generating industries globally. In 2021 the global food market generated

about 8.27 trillion US Dollars in revenue; it is forecasted that in 2027 it will reach 11.1 trillion (Statista, 2022). Like other industries, the food industry has often faced the threat of fraud. Food fraud, or more narrowed down as economically motivated food adulteration is an on growing risk and gaining both recognition and concern. Cases of food fraud have been registered at least since Medieval times, such as Medieval bread had been added chalk, wine used to be sweetened using lead, Americans were unwittingly eating horsemeat in the 1800's and in modern times many other cases have been committed such as baby formula had illegally enhanced protein content with the use of melamine (foodfraudadvisers, 2017). Food fraud can be done in various ways, not only by enhancing the product. Mislabelling a product's nutritional value, origin, or ingredient list is also considered food fraud. Such mislabelling is done with the intention of financial gain. The grocery manufacturers association estimates that global food fraud costs between 10 billion and 15 billion euros each year, affecting approximately 10% of all commercially sold food products (Manning, 2016).

1.1 Research Aim and Objectives

This research aims to evaluate the mitigation measures adopted by an industrial bakery in Malta to ensure the authenticity of wheat flour. Moreover, this research aims to delve into how preventive measures are applied to the business's day-to-day operations.

1.2 Research Methods, Material and Structure

The following chapter includes the literature review, whereby recent literature will be reviewed to delve deeper into the research subject and evaluate methods of prevention and mitigation measures adopted by businesses worldwide. Furthermore, the next chapter will help explain how wheat flour and other grains can be turned into a fraudulent product for monetary gain by the supplier.

Chapter 3 includes the research methodology. The research has been based on qualitative data, in which data has been generated through a face-to-face interview. The interview aimed to discuss and evaluate the mitigation measures adopted by an industrial bakery in Malta to ensure the authenticity of wheat flour. The interview results will be presented in Chapter 4, including an in-depth analysis and discussion of the results. Finally, chapter 5 includes the conclusion and recommendations.

2. Literature Review

Food fraud has been around since the beginning of the industry itself. Food fraud cases vary in many ways, such as enhancements to the products, adulteration, and other methods, such as mislabeling foods and falsifying documents. Mainly business owners or management employees have committed food fraud cases in order to help their businesses by achieving a financial gain and increasing profits or also in order to help their business reach demands when they are short of supply (Foodfraudadvisers, 2017). According to the European Union, food fraud has been defined as an action that is made with an intention to cause a difference between what the food product claims to be and what it really is or either by intentionally making false claims which are known to be false regarding the product or also omitting details which were supposed to be mentioned (Morin, 2018). Within the food supply chain and especially in significant production mistakes or even intentional changes to a product could quickly be done; therefore, the action was taken by the GFSI Global Food Safety Initiative [GFSI], which is a non-profit organization to provide better food safety

management (Soares, 2017). The GFSI hosted a think tank that classified food adulteration into two main categories, which are intentional and unintentional. Each category was further split into two subcategories (Morin, 2018).

1. Intentional adulteration:

a. Food fraud: Food adulteration is done intentionally, with the motive being financial gain.
b. Food Defence: Food adulteration where there is no financial motivation and the intention of the enhancement is solely to cause harm to the consumer.

2. Unintentional adulteration:

a. Food safety and
b. Food quality, where none of the adulterations occurred, are intentional and could be issues such as an accidental food-borne illness (Morin 2018).

2.1 food fraud.

Even though people who commit food fraud may not be considered career criminals, they are technically still committing a crime to the disadvantage of their consumers. This is because there are laws that directly address food fraud. An example of a law that addresses food fraud and the control of food quality and safety is Regulation (EC)1169 of 2011, which regulates specific issues such as labeling regarding food safety(appendix 1).
According to the GFSI, food fraud can be divided into seven types. All of these different food fraud methods are done intentionally by a business with the aim of financial gain (Morin, 2018).

These different categories of food fraud (Figure 1.) include:

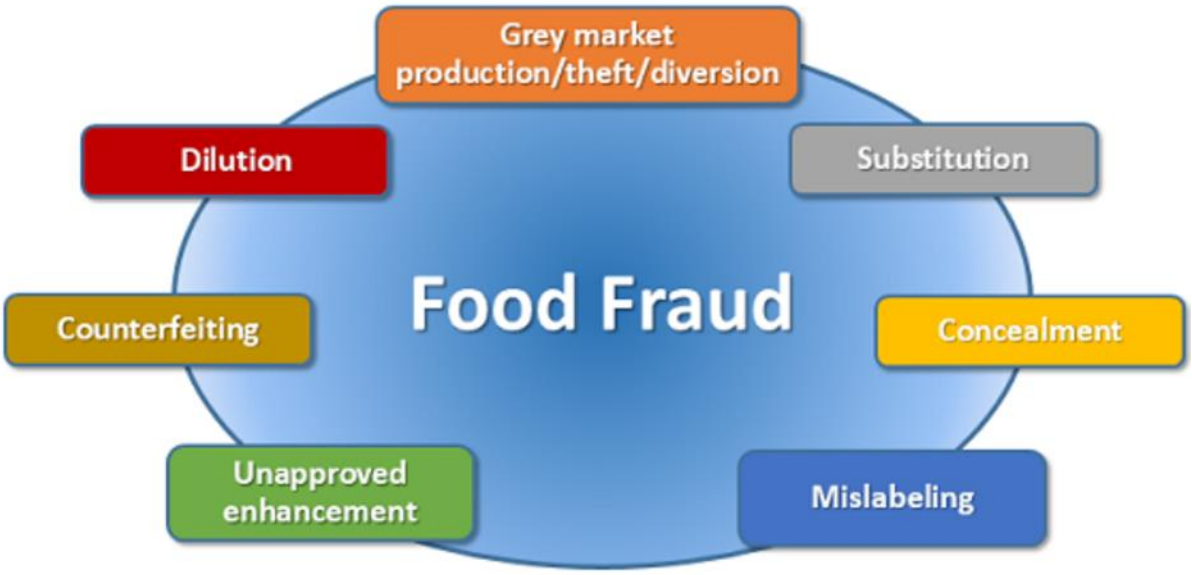

Figure 1. Types of Food Frauds adapted from knowledge for policy EC. 2022

Substitution is the process of substituting an ingredient that is usually one of high value with another ingredient that may usually be of lower value to save money when producing the product. This process may also be done during a shortage of one of the ingredients to keep up with demand. (Morin, 2018)

Dilution: This process is usually done with liquid products where a cheap liquid is added to a liquid of higher value to increase the volume. Adding water to milk or other drinkable products may be an example. (Morin, 2018)

Unapproved enhancement: This process involves adding an undeclared ingredient or substance to the product to potentially increase its quality substance. This is illegal as it aims to give the consumer the impression that the product is of higher quality than it really is. (Morin, 2018)

Concealment: Concealment is a process that's being done to hide the defects of a poor quality product and make it look like a higher quality one. (Morin, 2018)

Grey market fraud: this category of food fraud addresses unauthorized sales of a product that may have been produced illegally or even stolen. This may happen when an item's sale is not being declared or if the product is being sold in excess amounts than those permissible. (Morin, 2018)

Counterfeit products: this crime is committed when intellectual property rights are in effect. The action taking place may be copying aspects of another product on the market or even packaging being replicated. This may vary from copying a single label to copying an entire brand name or product in order to fool customers. (Morin, 2018)

Mislabeling: This is the process where a business may include statements on the packaging which are of false origins, such as the product's ingredient content or quality aspects. Expiry date changes are also included in this process. (Morin, 2018)

2.2 Food fraud cases.

Recently food fraud incidents have risen and have increased the need to strengthen the food industry's ability to detect and fight off food fraud across the supply chain (Lee, 2016). In recent years, many major food fraud cases have taken the industry by storm.

<u>The honey smuggling case.</u>

In 2008 an investigation revealed that several people from the German ALW food group (a German food trading company) were involved in mislabelling and enhancement of honey. This honey was enhanced with the use of sugars and flavored syrups, as the flawed harvesting methods have left a pungent smell on the honey. In 2013, even more charges were filed against the group for illegally importing honey from China, enhanced with antibiotics. (Lanzafame, 2022).

Kangaroo and horse meat scandal.

Back in 1981, an international scandal exposed a massive case of food fraud within the Australian export market, where it was discovered that kangaroo and horse meat were exported and sold as beef within the U.S. market (Lanzafame, 2022)

Whale meat which has been served as sushi.

While it was being done on a smaller scale than in other cases, it was discovered that a high-class sushi restaurant called "The Hump" was serving whale meat on its menu by mislabeling it as "fatty tuna ."(Lanzafame, 2022)

The Chinese milk scandal.

In 2008, china experienced one of the most prominent food fraud cases ever. One of their dairy producers had adultered their powdered milk with melamine to enhance its quality aspects. However, the compound is considered toxic and could cause kidney stones. To make matters worse, the milk powder enhanced was a baby formula that caused around 300,000 infants to fall sick, causing six of them to die. When the matter was being investigated, it was discovered that other dairy farms were committing a similar practice (Lanzafame, 2022).

2.3 wheat flour fraud.

One of the biggest Food frauds related to grains and wheat was exposed in 2019. A farmer, who sold over 120 million dollars worth of normal grain, has sold it as organic. The farmer had also stated he grew the grains himself, but it was discovered that most grains were actually bought and not even grown by him. Even if the grain was appropriately grown by the farmer, there were regulations that were supposed to be followed for any food to be certified organic. After being caught and charged, the farmer was found guilty and sentenced to 10 years in prison (Lanzafame, 2022)

2.3.1 production and importation of wheat flour.

Wheat is grown in many countries around the world using many climatic conditions and has been a staple food for around 8000 years. The most famous types of wheat are the common wheat and durum wheat (Varmeulen, 2018).

When it comes to authenticity issues within wheat flour the most common issue is usually deliberate substitution with the use of cheaper contents (Varmeulen, 2018).

In all EU countries, food businesses must abide by EU regulations regarding food safety, even when importing. Many countries usually have their methods when it comes to identifying the authenticity of the product. In countries such as Italy, paramount importance is set on tracking down the adulteration of durum wheat with the use of the common wheat flour. This is of significant importance as in Italy, only semolina is allowed to be used as a constituent for pasta and therefore in Italy the use of common wheat used in durum wheat is considered a fraud crime apart from the 3% which is allowed in order to account for cross-contamination during harvesting and production process (Varmeulen, 2018).

When importing or buying cereals such as wheat flour, many countries consider verifying the product's geographical origin, which gives them full traceability to determine its true quality and value (Morin, 2018).

2.3.2 Wheat flour certification.

Apart from products being enhanced, one also has to take into consideration the fact that nowadays, gluten-free and organic food is prevalent and the production of these products needs to be taken seriously. Therefore, a business producing these types of products must ensure it follows all regulations to be adequately qualified as organic or gluten-free, or this may also be counted as food fraud (Varmeulen, 2018).

Regarding organic products, issues may occur when non-organic products are passed off as organic, as this may not be noticed unless monitored during production or laboratory testing (Varmeulen, 2018).

On the other hand, gluten products must be tested as issues may occur if both intentional and unintentional contamination take place as this may cause public health risks (Varmeulen, 2018).

2.3.3 Wheat flour quality testing.

Wheat flour can be adulterated with the use of many different powders, such as being diluted with boric acid, which helps prolong its shelf life. In addition, chalk powder may also be added to the wheat flour to increase the quality of wheat flour and get more bargaining room (Tarafdar, 2017).

As protein is one of the most important quality aspects of wheat flour people who commit fraud may try to use specific methods in order to try and enhance the protein content within the flour in order to be sold as higher quality than it really is. This means the abuser will be able to sell at a higher price and exaggerate the product's quality and quantity (Kuktaite, Larsson, Johansson, 2004).

Protein plays a significant role in the wheat flour's quality assets as its quality depends on specific storage properties of the proteins such as the prolamins and also gluten and non-gluten proteins such as gliadins, glutenins, albumins and globulins, which in turn affect the visco-elastic properties of the dough (Varmeulen, 2018).

Therefore in many countries, wheat flour is protein tested using many methods, such as the PAGE method, which uses polyacrylamide gel electrophoresis, which is used to separate proteins that are then extracted from the flour and tested for their contents. In addition, other methods may be used, such as biomolecular methods (Varmeulen, 2018).

As the concern is continuously growing, many businesses are taking precautions and mitigation measures in order to avoid falling for fraud

when buying wheat flour from their suppliers, therefore making sure that the wheat flour meets the quality standards agreed with the supplier.

3. Methodology

This chapter describes the method used to collect the research data. Qualitative data were generated following a face-to-face interview with a local baker. This research aims to evaluate the mitigation measures adopted by an industrial bakery in Malta to ensure the authenticity of wheat flour. This will help give a better understanding of how food fraud is prevented within the local baking industry and give a clear picture of the potential food fraud of wheat flour.

3.1 Research method.

A qualitative research approach has been adopted for this research. This method gathers data through varied, open-ended questions and more informal communication. This method does not only gather and consider what people think but also considers their opinion. Qualitative research is based on specific aspects such as psychology, sociology and anthropology. By this, a qualitative research method allows for a more in-depth and further probing and questioning of the subjects based on their answers and opinions (Questionpro, 2022). This research method requires a small sample size as the researcher dives deeper into context to understand the subject's motivation and feelings. This

type of research can be done in many methods such as focus groups, ethnographic research, case study research, and record keeping. It could also be done with a one-to-one interview, just as the researcher is conducting for this current research. This research works towards solving issues and finding out more about a subject. It helps break down issues into meaningful results that are easily readable and understood by the reader (Questionpro, 2022). I chose this kind of research as my study is based on individual experiences and opinions. Quantitative research was not used as the data needed was more focused and in-depth rather than based on questions that could be answered in yes or no answers.

3.2 Primary data collection.

Primary data collection is a method used when a person is conducting an experiment or a study or trying to solve his way to a conclusion or answer. Primary data is ultimately found firsthand and gathered by the researcher from his participants or studies (Hox, 2005). For example, gathering a statistic from a survey is considered as primary data as it was collected firsthand.

When using a primary data collection method and are gathering data researcher has two options he can use when gathering data from a subject. The first method is the exploratory method which means the researcher is being more lenient and asking more questions that might spark up a conversation within the study. On the other hand, then there is the specific method where questions are usually more specific, close-ended and straight to the point.

For this study, primary data was collected using qualitative and exploratory methods by hosting a one-to-one online interview with a local baker. This interview was done on the 19th of May 2022 using the teams' application. For this study, an interview was chosen. Therefore an exploratory method was applied as the researcher wanted the subject to feel free to share any opinion and also wanted to spark up a conversation

in order to discover more about the subject and how this company tackles its problems.

The subject was asked several questions regarding the company the participant works in, their methods of preventing food fraud within their business, and what precautionary methods are taken when buying from a supplier.

3.3 Sample selection.

When using a qualitative research method, a smaller sample is usually used. This is because the researcher is not gathering answers for a number-based answer but rather to get more detailed answers which might help him discover more about the subject he is researching.

For this study, a purposeful sampling has been adopted. Purposeful sampling is used when the participants within your study are chosen because they have certain qualities which you need within your research. (Nikolopoulou, 2022)Therefore it was decided that the primary research gathering would be gathered by interviewing a local baking company's technical manager, allowing the study to be more focused and in detail regarding the company's methods.

3.4 Pilot study.

A pilot study was done before commencing the actual interview. This helps the researcher understand better how the actual outcome may be. This is usually done in preparation for the actual study in order to help avoid specific issues and therefore give the researcher the ability to fix or improve his research.

3.5 Method of Analysis.

For this study, the researcher used a thematic analysis as it is an excellent approach to take when the study aims to find out something about people's views, opinions, knowledge, experiences or values from a set of qualitative data (Caulfield, 2019).

All answers for this study were gathered and extracted by being recorded during the interview call. This helps me to access the interview

as many times as needed and let the researcher understand the actual words and emotions of the subject.

3.6 Limitations.

The sample size could have been bigger, considering I only hosted an interview with one local baking company, which is one of the largest. Therefore, data gathered may not be considered as representing the small businesses but is more focused on representing a large local baking company.

3.7 Ethical consideration.

A consent form (Appendix 2) and information letter (appendix 3) were sent to the participant by e-mail stating the aim of this research study. Also, the participant was informed that their name and the company's name would remain anonymous and that answering these questions would not in any way have any ill effect on the subject answering the questions or the company itself.

4. Findings and discussion.

This study was conducted to evaluate the mitigation measures that are adopted by an industrial bakery in Malta to ensure the authenticity of wheat flour and therefore avoid falling victim to food fraud. The interview was held on the 19th of May, 2022.

First off, the interview started with the technical manager of the company introducing a bit about herself and the company the participant works in. The technical manager answering my questions has been working within the company for about 13 years. The company has been operating for about 40 years and has now become one of the leading companies in its sector. The participant stated that the company has a large market where it sells its products both locally and internationally. Mainly the company produces a number of different savory snacks but also a variety of bakery goods, using wheat flour as the main ingredient.

4.1 Thematic Analysis.

4.1.1 Food fraud.

The participant was asked to define what the term food fraud meant for her. She answered by saying that food fraud for her is when a person intentionally falsifies or enhances a product for financial gain. Her answer was in line with the definition given within the codec Alimentarius commission which states that food fraud is any deliberate action by a business to deceive consumers regarding the integrity of the food in order to gain an advantage. (WHO, 2018)

4.1.2 Food standard certification.

While discussing the company, the researcher asked about any company procedures where the subject mentioned that the company was actually certified against the BRC standard. She explained that in order to be able to get the certification, a company would have to adjust many of its ways of operation in order to meet requirements set by the BRC's standard requirements in many areas such as training, cleanliness, supplier approval in order to avoid buying frauded products

and also conducting a vulnerability assessment in order to evaluate the risk of any products being bought apart from other factors.

BRC stands for British Retail Consortium, a globally recognized food safety standard first published in 1998. This standard was developed to provide complying businesses with a framework to maximize food safety, quality and integrity. This standard provides requirements within in several areas such as a food safety plan, senior management operations, product controls, site standards, personnel and process control (Pavlovic, 2017).

These food standard certifications play a significant role when it comes to fighting food fraud cases as it requires company to check and adequately audit their suppliers and all products supplied with methods such as supplier checks, risk evaluation of all products apart from other checks. Apart from this it also implements requirements when a company is conducting its own production operation to control product quality. When buying certain products which are at high risk for food fraud the BRC standard requires you to buy from other BRC verified companies in order to avoid certain risks (Pavlovic, 2017).

4.1.3 Company policies.

The participant also discussed how their business operates using a food safety and quality policy made by the business itself. This policy stipulates that food must be safe, high-quality, and authentic. When discussing food fraud, authenticity is of utmost importance. Food authenticity is a way of tackling the food fraud problem. It is a method that reassures a business that food products are genuine and, therefore can be verified as such and also shows that a food product is what it claims to be (Roberts, 2018).

Even though food authenticity is not something modern, it is now being given more attention after the occurrence of many publicized food fraud incidents over recent years, which has increased attention to issues of how authentic certain foods really are. Food authenticity has been in the

focus not only of businesses within the food industry but also regulatory agencies. (Everstine, 2018)

4.1.4 Vulnerability assessment.

The participant also discussed that due to their BRC standard requirements and also by company policies, their technical team must conduct a vulnerability assessment for every product they are purchasing. This assessment is a form of food defense that helps the business minimize the risk of food fraud vulnerabilities.

This vulnerability assessment is done in order to identify risks of food fraud within a specific product. the risk may vary depending on several different factors such as country of origin, supplier reliability, past cases, and external influences which may affect production, such as wars, natural disasters and other factors (Guzder, 2019).

An example of this given by the participant was that currently, Wheat flour is being listed as high-risk food after going through a vulnerability assessment. The participant states that due to the ongoing war between Russia and Ukraine wheat flour has become a high risk food. This is happening mainly because most of the wheat flour being imported to European countries was being imported from both Russia and Ukraine, but due to the war, importation of this product has come to a standstill due to higher production costs. This caused a shortage of the product which therefore resulted in higher demands which caused a high risk of suppliers who are still operating to enhance wheat flour for higher volume in order to meet demands. On the Other hand, Hopkins also states that this may also be happening as India has banned all exports of staple cereal after a heatwave hit India's crops, making prices even higher (Hoskins, 2022).

The participant stated that when a food product is a high risk, such as the current situation with wheat flour, their company is required to buy the product only from BRC standardized suppliers. Also, as a business, they stay updated with all current situations affecting the food industry

by doing research and receiving a weekly newsletter addressing all food fraud cases discovered globally.

4.1.5 Product testing.

The researcher asked the participant about any scientific testing the business does to reassure them that the products they are purchasing are authentic. The participant discussed that once every year they send a sample of each product they buy to be tested at a scientific laboratory, which qualifies as ISO 17025. Apart from these yearly tests, their verified suppliers must be able to analyze the product themselves and provide the company with a certificate of analysis regarding all the product's qualities. During these tests, the ingredient is tested for different quality affecting factors such as the number of pesticides the ingredient contains. Also, their products are tested in order to determine if they were exposed to any radiation and also tested for micro toxins and heavy metals. Most importantly, the participant said their products are also tested to check their nutritional value.

When especially talking about wheat flour, the participant said that their company uses different types of wheat flour for various products. This is done in order to achieve a perfect product which varies depending on the quality aspects of the given flour; therefore, the quality of the flour must be of what is stated within the Certificate of analysis given by their supplier but also the company tests the wheat flour in order to verify important quality aspects such as Moisture and Extensibility. Also, the participant stated that their company keeps a retention sample of every product batch that is delivered in case future testing needs to be done.

5. Final Arguments

5.1 Conclusions

With the food industry being one of the fastest growing industries in the world financially, it is no surprise that many are there to try their luck opening their own food business. However, with so many businesses opening their doors to producing their products starting from ingredients

to be used in recipes for other products such as wheat flour or even ready-made products ready to be sold within the retail sector, there is no doubt that concerns may rise as due to how much of the food we are buying is actually authentic and how much of it is actually what it states to be on the packaging.

This study was developed to find out what a local bakery goods business in Malta does during its operation to ensure they are buying good quality products which are authentic and fit for use to provide their customers with the best product possible.

During this study, the researcher discovered that food is a bigger problem than initially thought as it is not just enhancing a food product. However, there are seven different classes of food fraud.

For this research, a local company was found to participate in an interview regarding the subject and discuss their business's actions to prevent these situations.

During the interview the participant discussed that many precautions are taken by local business in order to prevent falling victim to food fraud such as being verified by a food standard operation such as BRC. Also, the participant discussed how they have certain procedures such as conducting vulnerability tests on their products, laboratory testing of their products and other methods such as verifying their suppliers.

Overall local businesses seem to be taking every precaution possible and taking the situation very seriously.

5.2 Recommendations

From this study, the author recommends that further research should be done on a larger scale as this study mainly tackled a very large businesses but finding out what smaller businesses do to prevent food fraud may be very helpful.

Also, when it comes to smaller business, more attention should be given as small businesses might not have the resources for testing and quality checking such as large businesses, which might make them more vulnerable for food fraud scams.

The author also recommends that locally further knowledge about food fraud should be given to the general public as after conducting the study, the author's opinion is that not so much attention is being given to food fraud when it comes to the public and consumers must be aware of what is going on within the industry where their foods are being produced in order to be able to stay aware of such cases and pay more attention to labeling when buying food although the study provided that ith current regulation in set in place by authorities they should not be highly concerned. Therefore, the author recommends that food fraud cases should be mentioned more within the local news or even maybe newsletters should be available to the public, such as the ones sent to big business.

Although testing is being done within large local businesses in order to ensure the authenticity of the product, the author feels that a test once a year is too little given that so many occurrences can happen during a year which therefore does not entirely ensure that all product batches are safe but only one batch. Also food fraud advisers (2019) recommend that testing frequency should be adapted depending on how risky a certain product is when it comes to food fraud (FoodFraudAdvisers, 2019).

When conducting this research, it was discovered that not many studies were done regarding the food fraud within wheat flour and other grains and how this should be prevented; therefore, in the near future, more studies could be done to help improve knowledge for professional and public use.

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Appendices

Appendix 1 : Regulation (EU) 1169 of 2011

REGULATION (EU) No 1169/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 25 October 2011

on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 114 thereof,

Having regard to the proposal from the European Commission,

Having regard to the opinion of the European Economic and Social Committee [1],

Acting in accordance with the ordinary legislative procedure [2],

Whereas:

(1) Article 169 of the Treaty on the Functioning of the European Union (TFEU) provides that the Union is to contribute to the attainment of a high level of consumer protection by the measures it adopts pursuant to Article 114 thereof.

(2) The free movement of safe and wholesome food is an essential aspect of the internal market and contributes significantly to the health and well-being of citizens, and to their social and economic interests.

(3) In order to achieve a high level of health protection for consumers and to guarantee their right to information, it should be ensured that consumers are appropriately informed as regards the food they consume. Consumers' choices can be influenced by, inter alia, health, economic, environmental, social and ethical considerations.

(4) According to Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety [3] it is a general principle of food law to provide a basis for consumers to make informed choices in relation to food they consume and to prevent any practices that may mislead the consumer.

(5) Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market [4] covers certain aspects of the provision of information to consumers specifically to prevent misleading actions and omissions of information. The general principles on unfair commercial practices should be complemented by specific rules concerning the provision of food information to consumers.

(6) Union rules on food labelling applicable to all foods are laid down in Directive 2000/13/EC of the European Parliament and of the Council of 20 March 2000 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs [5]. The majority of the provisions laid down in that Directive date back to 1978 and should therefore be updated.

(7) Council Directive 90/496/EEC of 24 September 1990 on nutrition labelling for foodstuffs [6] lays down rules on the content and presentation of nutrition information on prepacked foods. According to those rules, the inclusion of nutrition information is voluntary unless a nutrition-related claim is made concerning the food. The majority of the provisions laid down in that Directive date back to 1990 and should therefore be updated.

(8) The general labelling requirements are complemented by a number of provisions applicable to all foods in particular circumstances or to certain categories of foods. In addition, there are a number of specific rules which are applicable to specific foods.

[1] OJ C 77, 31.3.2009, p. 81.
[2] Position of the European Parliament of 16 June 2010 (OJ C 236 E, 12.8.2011, p. 187) and position of the Council at first reading of 21 February 2011 (OJ C 102 E, 2.4.2011, p. 1). Position of the European Parliament of 6 July 2011 (not yet published in the Official Journal) and decision of the Council of 29 September 2011.
[3] OJ L 31, 1.2.2002, p. 1.
[4] OJ L 149, 11.6.2005, p. 22.
[5] OJ L 109, 6.5.2000, p. 29.
[6] OJ L 276, 6.10.1990, p. 40.

(9) While the original objectives and the core components of the current labelling legislation are still valid, it is necessary to streamline it in order to ensure easier compliance and greater clarity for stakeholders and to modernise it in order to take account of new developments in the field of food information. This Regulation will both serve the interests of the internal market by simplifying the law, ensuring legal certainty and reducing administrative burden, and benefit citizens by requiring clear, comprehensible and legible labelling of foods.

(10) The general public has an interest in the relationship between diet and health and in the choice of an appropriate diet to suit individual needs. The Commission White Paper of 30 May 2007 on a Strategy for Europe on Nutrition, Overweight and Obesity related health issues (the 'Commission White Paper') noted that nutrition labelling is one important method of informing consumers about the composition of foods and of helping them to make an informed choice. The Commission Communication of 13 March 2007 entitled 'EU Consumer Policy strategy 2007-2013 — Empowering consumers, enhancing their welfare, effectively protecting them' underlined that allowing consumers to make an informed choice is essential both to effective competition and consumer welfare. Knowledge of the basic principles of nutrition and appropriate nutrition information on foods would contribute significantly towards enabling the consumer to make such an informed choice. Education and information campaigns are an important mechanism for improving consumer understanding of food information.

(11) In order to enhance legal certainty and ensure rationality and consistency of enforcement, it is appropriate to repeal Directives 90/496/EEC and 2000/13/EC and to replace them by a single regulation which ensures certainty for consumers and other stakeholders and reduces the administrative burden.

(12) For the sake of clarity, it is appropriate to repeal and include in this Regulation other horizontal acts, namely Commission Directive 87/250/EEC of 15 April 1987 on the indication of alcoholic strength by volume in the labelling of alcoholic beverages for sale to the ultimate consumer [1], Commission Directive 1999/10/EC of 8 March 1999 providing for derogations from the provisions of Article 7 of Council Directive 79/112/EEC as regards the labelling of foodstuffs [2], Commission Directive 2002/67/EC of 18 July 2002 on the labelling of foodstuffs containing quinine, and of foodstuffs containing caffeine [3], Commission Regulation (EC) No 608/2004 of 31 March 2004 concerning the labelling of foods and food ingredients with added phytosterols, phytosterol esters, phytostanols and/or phytostanol esters [4] and Commission Directive 2008/5/EC of 30 January 2008 concerning the compulsory indication on the labelling of certain foodstuffs of particulars other than those provided for in Directive 2000/13/EC of the European Parliament and of the Council [5].

(13) It is necessary to set common definitions, principles, requirements and procedures so as to form a clear framework and a common basis for Union and national measures governing food information.

(14) In order to follow a comprehensive and evolutionary approach to the information provided to consumers relating to food they consume, there should be a broad definition of food information law covering rules of a general and specific nature as well as a broad definition of food information covering information provided also by other means than the label.

(15) Union rules should apply only to undertakings, the concept of which implies a certain continuity of activities and a certain degree of organisation. Operations such as the occasional handling and delivery of food, the serving of meals and the selling of food by private persons, for example at charity events, or at local community fairs and meetings, should not fall within the scope of this Regulation.

(16) Food information law should provide sufficient flexibility to be able to keep up to date with new information requirements of consumers and ensure a balance between the protection of the internal market and the differences in the perception of consumers in the Member States.

(17) The prime consideration for requiring mandatory food information should be to enable consumers to identify and make appropriate use of a food and to make choices that suit their individual dietary needs. With this aim, food business operators should facilitate the accessibility of that information to the visually impaired.

(18) In order to enable food information law to adapt to consumers' changing needs for information, any considerations about the need for mandatory food information should also take account of the widely demonstrated interest of the majority of consumers in the disclosure of certain information.

(19) New mandatory food information requirements should however only be established if and where necessary, in accordance with the principles of subsidiarity, proportionality and sustainability.

[1] OJ L 113, 30.4.1987, p. 57.
[2] OJ L 69, 16.3.1999, p. 22.
[3] OJ L 191, 19.7.2002, p. 20.
[4] OJ L 97, 1.4.2004, p. 44.
[5] OJ L 27, 31.1.2008, p. 12.

(20) Food information law should prohibit the use of information that would mislead the consumer in particular as to the characteristics of the food, food effects or properties, or attribute medicinal properties to foods. To be effective, that prohibition should also apply to the advertising and presentation of foods.

(21) In order to prevent a fragmentation of the rules concerning the responsibility of food business operators with respect to food information it is appropriate to clarify the responsibilities of food business operators in this area. That clarification should be in accordance with the responsibilities regarding the consumer referred to in Article 17 of Regulation (EC) No 178/2002.

(22) A list should be drawn up of all mandatory information which should in principle be provided for all foods intended for the final consumer and mass caterers. That list should maintain the information that is already required under existing Union legislation given that it is generally considered as a valuable *acquis* in respect of consumer information.

(23) In order to take account of changes and developments in the field of food information, provisions should be made to empower the Commission to enable certain particulars to be made available through alternative means. Consultation with stakeholders should facilitate timely and well-targeted changes of food information requirements.

(24) When used in the production of foods and still present therein, certain ingredients or other substances or products (such as processing aids) can cause allergies or intolerances in some people, and some of those allergies or intolerances constitute a danger to the health of those concerned. It is important that information on the presence of food additives, processing aids and other substances or products with a scientifically proven allergenic or intolerance effect should be given to enable consumers, particularly those suffering from a food allergy or intolerance, to make informed choices which are safe for them.

(25) In order to inform consumers of the presence of engineered nanomaterials in food, it is appropriate to provide for a definition of engineered nanomaterials. Taking into account the possibility of food containing or consisting of engineered nanomaterials being a novel food, the appropriate legislative framework for that definition should be considered in the context of the upcoming review of Regulation (EC) No 258/97 of the European Parliament and of the Council of 27 January 1997 concerning novel foods and novel food ingredients ([1]).

([1]) OJ L 43, 14.2.1997, p. 1.

(26) Food labels should be clear and understandable in order to assist consumers who want to make better-informed food and dietary choices. Studies show that easy legibility is an important element in maximising the possibility for labelled information to influence its audience and that illegible product information is one of the main causes of consumer dissatisfaction with food labels. Therefore, a comprehensive approach should be developed in order to take into account all aspects related to legibility, including font, colour and contrast.

(27) In order to ensure the provision of food information, it is necessary to consider all ways of supplying food to consumers, including selling food by means of distance communication. Although it is clear that any food supplied through distance selling should meet the same information requirements as food sold in shops, it is necessary to clarify that in such cases the relevant mandatory food information should also be available before the purchase is concluded.

(28) The technology used in the freezing of foods has developed significantly during recent decades and has become widely used both to improve the circulation of goods on the Union internal market, and to reduce food safety risks. However, the freezing and later defrosting of certain foods, especially meat and fishery products, limits their possible further use and may also have an effect on their safety, taste and physical quality. Conversely, for other products, especially butter, freezing has no such effects. Therefore, where a product has been defrosted, the final consumer should be appropriately informed of its condition.

(29) The indication of the country of origin or of the place of provenance of a food should be provided whenever its absence is likely to mislead consumers as to the true country of origin or place of provenance of that product. In all cases, the indication of country of origin or place of provenance should be provided in a manner which does not deceive the consumer and on the basis of clearly defined criteria which ensure a level playing field for industry and improve consumers' understanding of the information related to the country of origin or place of provenance of a food. Such criteria should not apply to indications related to the name or address of the food business operator.

(30) In some cases, food business operators may want to indicate the origin of a food on a voluntary basis to draw consumers' attention to the qualities of their product. Such indications should also comply with harmonised criteria.

Appendix 2 : Consent form.

Consent Form

Name and Surname of Researcher: Kurt Scicluna

ID number of researcher: 0219200L

Email address of researcher: kurt.scicluna001@its.edu.mt

Mobile number of researcher: 79232090

Course: HND in culinary arts

Tutor name and surname: Joseph Cassar

Tutor office telephone number:

Title of the Long essay/Dissertation: Wheat flour fraud: mitigation measures by an industrial bakery in Malta.

Dear Sir / Madam,

I, Kurt Scicluna, a student at the Institute of Tourism Studies am currently in the final year of my Higher National Diploma, I am carrying out research on the above-mentioned title.

I had already sent you the information letter about my research and you had provided me with a signed information letter. If you have any further questions for clarification, please do not hesitate to ask me.

By signing this consent form, you are giving me your consent to use the data collected through the interview for the analysis of the results. I will send you a list of questions before the interview so you can prepare yourself beforehand. The questions asked will be about mitigation and preventive measures you company takes in order to avoid and safeguard itself from becoming a victim of fraud when buying wheat flour and also about food fraud within your industry.

The information collected will be kept strictly confidential. All data will be stored securely and will be made available only to those individuals conducting the study. No reference will be made in oral or written reports that could link you to the study. Your identity will not be revealed in any publications that result from this study.

You can terminate your participation at any time without prejudice. Participation is voluntary. You do not have to answer individual questions if you do not want to. Your name will not be attached to the interview and will ensure that your participation remains confidential. Kindly, contact me if you have any queries or require any further clarification.

Participant's declaration

I have read this consent form and am giving the researcher the opportunity to carry out the research at my company. I hereby grant them permission to use the information provided as data in the above-mentioned research project, knowing that it will be kept confidential and anonymous.

Participant's Name	Participant's Signature	Date

Researcher's Name	Researcher's Signature	Date

Appendix 3 : Information letter.

Information Letter

Name and Surname of Researcher: Kurt Scicluna

ID number of researcher: 0219200L

Email address of researcher: kurt.scicluna001@its.edu.mt

Mobile number of researcher: 79232090

Course: HND in culinary arts.

Tutor name and surname: Joseph Cassar

Tutor office telephone number:

Title of the Long essay/Dissertation: Wheat flour fraud: Mitigation measures by and industrial bakery in Malta.

Aims of the research: The aim of this research is to evaluate the mitigation and preventative measures that are adopted by an industrial bakery in Malta to ensure authenticity of wheat flour

Dear Sir / Madam,

I, Kurt Scicluna, a student at the Institute of Tourism Studies am currently in the final year of my higher national diploma in culinary arts, I am carrying out research on the above-mentioned title.

My research is based on food fraud within the wheat flour industry and the mitigation and prevention measures that are taken within local industrial bakeries in order to avoid such fraud. The method of data collection will be a one to one interview. The data collected from the interview will be used for the sole purpose of this research. The data will be collected by asking questions in an audio recorded face-to-face interview at your esteemed company. The data will be collected in an inductive exploratory interview and will be transcribed. The data will be thoroughly analysed to collect the answers to the above-mentioned aims of the research. I am kindly asking for your consent to have a face-to-face interview with you. The purpose of this letter is to provide you with information so you can decide whether to participate in this study. Any questions you may have will be answered by the researcher.

There are no known risks related with this research project other than possible discomfort with the following:

- You will be kindly asked to be honest when answering questions.
- Any audio recorded data will be used for transcription purposes, after which it will be destroyed.

The information collected will be kept strictly confidential. All data will be stored securely and will be made available only to researcher. No reference will be made in oral or written reports that could link you to the study. Your identity will not be revealed in any publications that result from this study.

You can terminate your participation at any time without prejudice. Participation is voluntary. You do not have to answer individual questions if you do not want to. Your name or the name of you company will not be attached to the analysis of the results and will ensure that your participation remains confidential. Kindly, contact me if you have any queries or require any further clarification.

Participant's declaration

I have read this consent form and am giving the researcher the opportunity to carry out the research at my company. I hereby grant them permission to use the information provided as data in the above-mentioned research project, knowing that it will be kept confidential and anonymous.

Participant's Name	Participant's Signature	Date

Researcher's Name	Researcher's Signature	Date