

Improving Food Safety and Food Quality: The Case of Nestle

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ABSTRACT

Food safety and food quality are important issues in the food industry. The food manufacturers are responsible to provide a high quality, clean and safe food to consumers. Mismanaging food safety and food quality may potentially lose the food's nutritional value and bring harm to consumers' health and put the food manufacturers' reputation at risk. Nestle is one of the world largest food and beverage companies located in 190 countries and offers more than 2,000 brands to their customers. One of the many reasons behind the success of Nestle is their strong leadership, with their vision and strategies, making a long-term commitment to the health and well-being of their customers. Nestle constantly identifies ways to improve the nutritional profile of their foods and ensure the food safety and food quality are their top priority concern. The paper presents the factors affecting food safety and food quality in Nestle. The paper also discusses how Nestle improves the food safety and food quality.

Keywords: Food quality, Food safety, Health, Nutrition, Nestle

INTRODUCTION

Food safety and food quality are always the top concern of the consumers. According to Fernando, Ng and Walters (2015), food safety and food quality are important for the consumption of the consumers. Safe and healthy food is needed for the health and the well-being of the consumers. Food safety and food quality are necessary ingredients to develop human capital. Safe and healthy food should be achieved by implementing food safety management system throughout the entire food production chain from raw materials through processing up until the food is ready for the consume. According to Veronica Tuffrey, Thomas Krikser, Antonia Trichopoulou, Adnan M. S. Fakir, Rostyslav V. Bubnov and Ghose Bishwajit (2017), food safety is often described as a scientific discipline which includes handling, preparation, and storage of food in ways that prevent foodborne illness. This includes a few routines that should be followed in order to prevent potential severe health hazards. Food safety often overlaps with food defense to avoid harm to the consumers. As more and more people are getting concerned about food safety, the demand for food safety in the food industry is increasing and also leading to structural changes in the food supply system worldwide. Emond and Taylor (2018) reported that understanding and measuring food safety and quality culture is important. Therefore, having the right culture and particularly the right food safety and quality culture is a key success factor for any food business.

Nestle's, based in Switzerland, is the one of the world's leading food and nutrition company measured by revenues. Nestle sells various types of foods and beverages

such as baby foods, cereals, coffee, confectionery, frozen food, pet foods, yogurt and also snacks. The company uses an extensive distribution channels worldwide to sell their food and beverages production and spread them out from facilities run by the company in over 100 countries. Nestle also owns several major consumer brands such as Stouffers, Nescafe, Kit-Kat, Carnation, Nestle water, among many others used by millions each year and which have established Nestle's successful global brand image. This success can be attributed to clear focus and vision, as well as success in its continual differentiation and brand positioning which strengthen its market position. To sustain this success and thus maintain leadership in its market, the company must often audit and review its strategic position considering changing factors in its business environment.

In this case study, we are going to look at Nestle's food safety actions. We want to explore how they implement their quality and food safety policy and how the policy can be improved, helping Nestle to both become more successful and to contribute to a healthier generation. We do believe that even if Nestle already have taken on a lot of actions towards food safety in their productions, there are always improvements to be made. As a worldwide company, quality and safety is Nestle's top priority. Nestle ensure that the steps in finding materials, preparations, processing, testing, packaging and transportation are their top priority so that their products are safe to be consumed. In Nestle, new product development may involve the use of new ingredients, new applications of traditional ingredients, or new process technologies or conditions. Before any product launch, Nestle ensure that these products are safe and compliant with any regulatory requirements. All the relevant chemical and microbiological hazards are identified and scientifically assessed in the labs in Nestle company. Moreover, upstream food safety assessments are then carried out at the new product development level, hence integrating 'design safety into the product' which is to establish safety testing strategies to meet regulatory requirements and also to establish product specifications which are translated into operational management programs ensuring the manufacturing of safe products for all consumers. Nestle should maintain and develop a high level of expertise in research and development (R&D) within the company such as supporting research and product development cooperation throughout the entire food supply chain and increasing interaction between research areas in developing more high-quality food in the research environments.

Therefore, in this case study, we want to focus the research on alternative ways in improving R&D for Nestle. An alternative that we suggest is for Nestle to increase R&D department to ensure food handling and processing is always carried out to a high standard and the quality of the products produced is always consistent. This way, consumers can trust and consume food products as there is assurance in terms of food safety regulations.

2.0 BACKGROUND OF THE IDEA

2.1 Understanding Research and Development (R&D)

According to Will Kenton (2019), research and development (R&D) is the activities that most companies take on in order to innovate or introduce new products and services to the consumers. R&D is generally linked to innovation both in the corporate and government world or the public and private sectors. An R&D program can help companies to stand out compare to other companies and also make them to become on top of its competitors as well. Without an R&D program, a company might not be able to survive on its own and may have to rely on other methods such as engaging in

mergers or partnerships. Moreover, through R&D, companies are able to design new products or improve their existing offerings to their customers.

2.2 The role of R&D in Nestle quality and safety

Nestle's top priority for their consumers is quality and safety. Nestle R&D organization has a Quality and Food Safety Network which has several different elements such as:

- Early Warning Network, which helps to identify and avoid potential safety issues.
- Microbiological Safety Network, which provides fast and reliable microbiology safety assessments.
- Analytical Methods Network, which helps to develop and improve analytical standards.
- Global Analytical Laboratories Network, where Nestle has 25 regional testing labs that helps to provide analytical data and Quality Assurance support to operations and Nestle R&D.

Nestle uses a variety of analytical methods in order to detect and quantify chemical compounds. This is a part of their commitment for quality and safety. The methods that they use in factories include titration, ELISA, and HPLC. However, the other methods such as UPLC, GCMS, LC-MS-MS and TOF-MS are often used in regional labs and at Nestle Research. In addition, Nestle will ensure they make numerous quality checks every day where they gather around 200,000 analytical results per day at the factory level. Nestle also monitors all of the materials and products as their regional labs generate 10,000 safety results per day.

2.3 Nestle Quality Policy and Quality Management System

Nestle's actions to ensure quality and food safety are guided by the company's Quality Policy which describes their commitment by:

- Building the consumers' trust by offering high quality products and services that match with their high expectations and preferences.
- Complying with all the internal and external food safety, regulatory and quality requirements within Nestle.
- Gaining a zero-defect and no-waste attitude by everyone in the company.
- Making quality a group-wide objective.

Nestle uses Quality Management System globally as a platform to guarantee food safety, compliance with quality standards and also to create value for their consumers. Quality Management System of Nestle is audited and verified by independent certification bodies as a proof of conformity such as internal standards, ISO norms, laws and regulatory requirements. Nestle Quality Management System starts on farms. Nestle cooperate with the farmers living in rural communities to help them in improving the quality of their produce and adopt environmentally sustainable farming practices. This also helps to increase quality raw materials and enables farmers to increase their income.

Furthermore, during product development, the quality is built in according to the consumers' requirements and also the food safety and regulatory requirements. Nestle's R&D network applies in this "Quality by design" to all their products. Nestle also apply internationally recognized Good Manufacturing Practices (GMP) and HACCP (Hazard Analysis and Critical Control Point) to ensure quality and food safety. GMP covers all aspects of manufacturing such as standard operating procedures,

people management and training, equipment maintenance and handling of materials while HACCP is a preventive and science-based system that will do the identification, evaluations, and also control the hazards that are important for food safety. It helps to cover the entire food production process from raw materials to distribution and also to consumption. Nestle's HACCP plans and systems are verified by external certification bodies against the international ISO 22'000:2005/ISO 22002-1 standards. Nestle's products carry useful information to ensure that they are safe to be consumed and compiled with the highest level of quality for their consumers.

2.4 Nestle commitment issues in food safety

Over the last few couple of years, there have been several issues happened where Nestle was criticized heavily by the public due to lack of food safety. In September 2008, the Hong Kong government found out and reported that there was melamine in Nestle milk product and the product had caused six infants died from kidney damage and about 860 babies were hospitalized. The milk product was created by the Nestle's division in Qingdao, China. However, Nestle affirmed that their products were safe to consume and were not made from milk adulterated with melamine. On 2nd October 2008, the Taiwan Health ministry announced that the milk powders that were produced by Nestle in China contained low-level traces of melamine and thus, the products were removed from the market.

Next, in June 2009, an outbreak of E. coli O157:H7 happened which was connected to the Nestle's refrigerated cookie dough which originated in a plant from Danville, Virginia. In the United States, there were more than 50 people in over 30 states that were hospitalized due to the consumption of Nestle's cookie dough. Nestle then voluntarily withdraw about 30,000 cases of the cookie dough. The main reason behind this cause was then determined to be the contaminated flour acquired from a raw material supplier.

In May 2015, Nestle's noodles, Maggi containing more than 17 times beyond permitted safe limits of lead and monosodium glutamate were found out by the Food Safety Regulators from Uttar Pradesh, India. Therefore, in June 2015, New Delhi Government banned the sellers from selling Maggi products in New Delhi stores as the products were really found to be containing excessive amount of lead and monosodium glutamate.

2.5 Idea to improve the role of R&D in Nestle

In Nestle, research and development (R&D) is a key competitive advantage in competing with other food companies. Without R&D, Nestle could not become the leading food industry in nutrition, health and wellness of today.

Our idea to improve food safety in Nestle is increase research and development (R&D) department to ensure food handling and processing is always carried out to a high standard and the quality of the production is always consistent. Nestle needs to spend more money on R&D. This is because Nestle has more technology at its disposal to achieve greater feats in the R&D department such as social media, digital surveys and email marketing. Improving R&D department will also help Nestle to acquire more options in increasing production, food quality and food availability to consumers.

In addition, technologies are the vital part of Nestle R&D. Investment in technology will help Nestle to lower the production cost and improve product quality. For example, technologies developed by Nestle allow them to use natural vegetable oils instead of

partially hydrogenated fats in Maggi bouillon cubes and seasonings. With the help of technology improvement, Nestle can create healthier products across their product range and help to improve health and quality of life of their consumers.

Moreover, there are a lot of demands over safe and healthy food among the society. Consumers today are health conscious as they care about their health and want to lead a healthy lifestyle. They expect Nestle to create healthy, quality and safe products so that they feel assured and trust Nestle when they consume Nestle's products. Therefore, Nestle should always continue to do more and improve R&D on their products in order to create a healthier future and enhance the quality of life of their consumers. More R&D will allow Nestle to bring a lot of advantages for consumers, communities and the planets.

3.0 JUSTIFICATION IDEA

3.1 R&D helps to improve food safety and quality

Food safety is a scientific discipline describing handling, preparation, and storage of food in ways to prevent and avoid foodborne sickness. According to Tomáš Sadílek, food quality is a multidimensional concept, and consumers link it with factors like food safety, nutrition, organic production, fair trade, free-range, animal welfare, origin and locally grown. As a result of food safety scandals and the increase in health-conscious diets and environmentally conscious consumption patterns, consumers have taken more cautious attention to make rational decisions and healthier choices for food. Therefore, quality and safety of food are clearly related. Nestle had made a great move with their research and development (R&D) by implementing their Quality and Food Safety Network to improve their food quality and safety. All relevant chemical and microbiological hazards are identified and assessed scientifically. Upstream food safety assessments are then carried out at the new product development level which therefore integrated into 'design safety into the product' in order to establish safety testing strategies. By this, the regulatory requirements and products specifications are established which are then translated into operational management programs. These programs help to ensure the manufacturing of safe products for all consumers. Usage of new ingredients, new applications of traditional ingredients or new process using technologies are usually involve in the new product development. Before any launching any products officially, Nestle had ensured that the products are safe and in compliance with regulatory requirements.

Besides, R&D is an essential beginning point towards the creation or modification of new products, processes and packaging. To ensure that a food product is safe for consumption, the most important part is that the food quality should be considered during the initial stages of a product's lifecycle. Incorporating food quality into R&D can be difficult, as safety considerations may alter the primary idea or concept of a new food product. For instance, Nestle had tested their products for micro-plastics since 2015 using advanced devices and techniques. Micro-plastics are small plastic pieces less than 5mm long that we can find anywhere, from the air we breathe, to the food we eat and in the water we drink. But so far, Nestle has not detected micro-plastics beyond trace level in their food and beverages. Hence, R&D helps to improve food safety and the quality of a company. It also brings innovations to the business. These may be in the form of new products and services, improved processes and new ways to interact with the customers. These innovations can bring in higher profits and lower the cost of productivity. Moreover, R&D helps to improve the reputation of the company so that it becomes a well-known company. Thus, Nestle should continue to improve their R&D

so that they are always committed to satisfying their consumers with healthy food and beverages of the utmost safety and quality.

3.2 R&D helps to improve productivity and products differentiation

Research and development is a valuable tool for growing and improving any business. R&D involves researching market and developing new and innovative products and services to satisfy the customer needs. Businesses that have a R&D strategy have better and higher chance of succeeding rather than businesses that do not own R&D. A R&D strategy can lead to great innovation and increase the productivity of an organization and can boost business's competitive advantages. The research and development process can help firms to gain more competitive advantage by performing in a way that their rivals cannot easily copy or reuse the ideas. If R&D efforts are able to lead a company to an improved type of business process, such as reducing the cost or increasing productivity by using the new technology, it is an easier method to outperform the competitors.

Nestle have been constantly striving to make their products tastier and healthier so that their consumers will care for themselves and their families. This success would not be possible without their outstanding R&D capability, quality of management and the good relationship with suppliers and customers. For instance, Nestle had invested more than \$500 million in the last few years in order to develop health and wellness products which in return help to prevent and treat major ailments and diseases such as diabetes, obesity, cardiovascular disease and Alzheimer's, which was very troubling diseases at that time when budgets are being squeezed. Nestle also make an effort in creating a wholly owned subsidiary which are Nestle Health Science, Nestle Nutrition Institute and the Nestle Institute of Health Sciences.

Hence, R&D helps in building all aspects of quality into new products and processes right from the start of any project. This process includes everything from the processing of raw materials to the packaging and the quality of the product at the time of consumption. This means that putting in all process controls in the factory help to ensure that there are strict tolerances in delivering high quality products to the consumers. Nestle R&D should continue to improve and develop many new analytical methods needed to fill the ever-growing demand for product testing from international to national safety authorities. Nestle R&D is closely related to Nestle's Nutrition, Health and Wellness as they claim that their products offer the competitive edge. In such cases, Nestle working with food trade organizations and government laboratories can help to find solutions. Many methods developed by Nestle R&D become international standards R&D process which give Nestle a time lead, which also means that it will help Nestle to improve their products and learn from their mistakes so that Nestle can win over their competitors. Improving R&D will help to conduct researches and surveys to get closer to their target market and to open to reach to new customer segment like Nestle fitness line.

3.3 R&D helps to strengthen Nestle's position as leader and offering tastier and healthier choices

Research and Development (R&D) is a part of Nestle's global R&D network which supports all the markets worldwide with new product development and manufacturing excellence. It is also a center of expertise for local cuisine within the Nestle R&D network and helps Culinary, Confectionery, Nutrition and Dairy products in the South Asia Region (SAR). Improving and having better nutrition in the region is a never-ending challenge. It means changes with the stage of development, the degree of

social awareness, and scientific advancement. Improving R&D facility will help Nestle to develop great tasting food solutions that are relevant for their consumers and creating products that take the promise of taste and health to a much broader economic and social section than before. This will also strengthen Nestle's position as the leader in Nutrition, Health and Wellness in the emerging markets. For instance, Nestle India has always had Research and Development support from the Nestle R&D network across the world. Having an improved R&D Centre to Nestle businesses, and reflects their spirit of R&D-Business partnership towards developing winning concepts which is suited to the local consumers will help Nestle R&D to bring out strong local concepts that are in accordance with Nestle's ambition in providing 'affordable Nutrition, Health and Wellness' products to their consumers. Ultimately, these concepts will not just be relevant for emerging markets to country like India but could be transferred to Nestle worldwide.

Furthermore, R&D of Nestle aims to offer tastier and healthier food choices and help more than 50 million children to lead a healthier life in their daily life. For example, India is currently facing the double burden of malnutrition and obesity, where nearly almost 253 million adolescent populations in dire need of appropriate nutrition, counseling, education and also guidance. According to the National Family Health Survey, the number of obese people has nearly doubled, while the status of under nutrition has remained stagnant. Furthermore, a UNICEF study had proven that the rate of regular consumption of food rich in vitamin A and iron is extremely low especially among infants and young children in India. Hence, improving R&D strive to continuously develop a better understanding of the changing lifestyles of consumers and anticipate consumers' needs in providing tastier and healthier food choices, which consists of high quality, safe and also affordable for all people of life stages. R&D also helps in responding to consumer demand and does their part in helping to contribute to a healthier future, by launching more nutritious, high-quality foods and beverages, simplifying ingredient lists and removing artificial colors. Nestle R&D fortifies foods with micronutrients to help address health challenges where it is relevant and also further in decreasing sugars, sodium and saturated fat in their products and instead, increasing more vegetables and whole grains across their portfolio.

RESULTS AND DISCUSSION

4.1 Increasing R&D department in food research and technologies

Many aspects of food including flavor and nutritional content, quality, handling, storage and safety, processing, preservation, packaging and distribution are needed to be considered in a food industry. Increasing research and development department in food research and technologies can help to improve food safety and the whole production in Nestle. Nestle should hire more food scientists that specialize in specific fields. A food scientist can work in different types of roles such as food technologist, food microbiologist, new product developer, food tester, laboratory scientist, quality control manager, or even a nutritionist. Besides, food scientists work in any industry which is closely related to food such as from major food and beverage brands to research organizations, to flavor producers and regulatory authorities. One of the main roles of food scientists is checking raw ingredients and processed food to know its nutritional value, safety and quality. They should also do continuous research on the process of food, preservation and quality of food, deterioration of food as well as packaging, storage and delivery of food in order to improve them. This is a way to ensure every process involving in the production in Nestle should always be consistent and meet to the high quality standard. Maintaining safe and hygienic conditions during

processing, storage and packaging of food is also part of the food scientists' responsibility. They must make sure that the environment in the production and factories are always clean and safe so that any harmful or dangerous compounds are cleared off.

4.2 Exchange between employees across global research & development (R&D)

Acquire a foreign market specialist to be a team at no additional cost. According to Starmind (2018), employees will give the chance to become an expert in the relevant market of the visited country by sending abroad the employees. Besides, the nature of the exchange will make sure the employees will benefit from a unique training opportunity which can help to accelerate their career. This is a mobility scheme which is based on the idea of lifelong learning and sharing knowledge is the new property for employees to get professional development. This will make the employees even more valuable resources besides acting as a bridge with the hosting company. The employees also will acquire specialized knowledge that could open much different kind of doors. For example, skills and knowledge include understanding the law of food safety, the awareness of the risks, diverse health issues relating to food safety and food hygiene matters in different countries. Employees can gain knowledge about food safety issues cover what they must do to food to keep food safe and learn new ways of food hygiene practices to decrease contaminate food. Selected employees then return to their country to share their newly gained experience, knowledge, skills and insights with other colleagues. This is a chance for the employees to learn and develop new skills and techniques.

The continued success depends on employees who are gaining first-hand experience with diverse business environments and cultures across global network – to share their expertise, develop new skills, establish valuable connections and relationships and the progress both personally and also professionally. Offering employees an opportunity to further their career and also a chance to experience new cultures can create loyalty with the key employees. Furthermore, providing employees with the opportunity to fulfill their potential will create a greater allegiance to the company. It gives them a chance to up-skill themselves and knowing that their employers are willing to support that will do wonders for their loyalty to the business.

4.3 Collaboration with other companies and investment in innovation hubs

Research and development are the one of the principal determinants of how Nestle produces quality products. Nestle should keep maintaining the strong emphasis it has on research and development. One of the ways to improve research and development in Nestle is setting up collaboration with other food companies. It is true that Nestle must face a certain degree of compromise when it comes to giving out their information and data about their research to other parties. But that compromise would give a mutual benefit between Nestle and other companies in the long term in their research and development as the sharing of intellectual property between other parties may give Nestle a perspective of new technology and innovative ideas that Nestle has yet to find or may not. The benefit of this mutual collaboration will give a considerable amount of payback. But to reach a mutual agreement between Nestle and other parties in sharing their intellectual property, Nestle should first create a solid legal contract that is agreed upon by both parties. The contract should include conditions such as the exact descriptions of the intellectual property that will be shared among them, protocol for exchanging and storing data, and compensation for leaked intellectual property.

To add on, Nestle should invest in innovation hubs such as universities or research organizations. This could reduce the cost of research and development of Nestle as these academic institutions are usually research-intensive. Universities and research organizations have a pool of talented researches and this is where Nestle should tap into by forming partnerships with them and providing financial support by funding their research. For instance, according to Kenneth R. Lutchen (2018), the company can co-fund PhD students in their researches that are of area of interest to Nestle with also the help of Nestle food and science engineers to get a better understanding of the progress. Area of interest to Nestle could be research in gut bacteria to gain insight into how to create new bio technologies from that foundation. To facilitate the transfer of information of the academic institution's research, Nestle can set up their research and development facilities near these academic institutions. This move allows Nestle to gain access to cutting edge research and scientific talent concurrently. Moreover, Nestle could offer an attractive hiring package to those talented researches to be part of Nestle growing workforce for their successful research in new food technologies.

4.4 Provide more training and improve employees' R&D technology knowledge and skill

Most companies use R&D in order to innovate or introduce new products. Implementing R&D often happens in the first stage of the development process. Thus, innovation and creativity of the staff are the most important factors that influence the business development in future. Employees in R&D Department need to be equipped with good knowledge and acquire good skills in terms of creativity, innovation, portfolio and performance management, and have bright ideas in knowing how to bring innovation to market. Training presents a prime opportunity for the potential employees so that they can improve and enhance their hard and soft skills and also widen their span of unlimited knowledge. An employee can improve their productivity and efficiency through training that is provided by the organization. Training is generally imparted in two ways that are on the job training and off the job training. First of all, on the job training methods are usually given to the potential employees every day. This is one of the simple and cost-effective training methods as the employees are trained as if they are really working for a company. This type of training is beneficial to the employees and usually it is known as "learning by doing" because the employees were taught by different types of methods such as job-rotation, coaching, and temporary promotions. On the other hand, off the job is a training method that is given to employees to work on other kinds of jobs. This method is usually given to new employees. The examples of the off the job training methods are through workshops, seminars and conferences which are organized by the organization. However, this method is quite costly but quite effective because through this method, the large numbers of employees are to be trained in a limited time period. Off the job training is commonly known as a vestibule training where the employees are trained in a separate area where the actual working conditions are duplicated.

Under the strategy of developing human capital, the Human Resource Development Department can cooperate with Technology and R&D Department to provide employees with education on R&D and food quality and safety. The company can give sponsorship to the talented staff to attend about R&D management program which in return helps to boost their skill and knowledge base. R&D Management program is to acquire the tools to structure and process the experience and knowledge by making it usable and transferrable. Employees can learn that "selling" creativity, the management of the supply chain of ideas, the decision-making and the prioritization of processes, the management of performances and the importance of fairness were

addressed and made clear. They can use the new insights and knowledge gained in the program become more effective, persuasive and has influence on decision-making processes in their organization. The company can also provide technical training for employees such as quality management training for young leaders, technical training seminars on product liability and product safety and also training on software design quality. Quality Management Training should be given to young employees especially targeting those who are expected to play important roles in the next generation. Thus, the attendees range from young to mid-career design engineers. Technical training seminars on product liability and product safety are used to raise the product liability awareness and to encourage every employee to engage in every kind of aspects such as in designing, manufacturing, marketing or even servicing. This is so that they can apply these kinds of concepts into their daily jobs to deliver safety, comfort and a sense of security. Training on Software Designing Quality response to an increase in the importance of software applied in products. In line with the software development process, the company can provide training on using the following three steps: requirement analysis, software design, and software verification.

CONCLUSIONS

Apart from increasing research and development (R&D) in order to improve food safety in Nestle company, there are also a few other recommendations that can improve Nestle's food safety for their products. One of the recommendations is Nestle's products should have real and trustworthy information in labeling. For example, there should be accurate percentage of ingredients uses in producing the products in labeling. The labeling products should also have halal certification so that Muslim consumers are assured that it is safe to buy and consume Nestle's products. Labeling is important as it represents the whole product fully with important information for the consumers to review.

Furthermore, Nestle should take initiative in solving problems involving food safety regarding their own products. This is to avoid further complications and not breaking trust between customers and company. Nestle should take serious approach in solving food safety problems as they should consider the cause and effect, they are causing towards consumers who are consuming their products in everyday life. Hence, Nestle should always keep an eye on their external issues and solve them without haste as the issues might affect the brand's name.

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