DNV·GL

The Consumer Goods FORUM

GFSi

BUSINESS ASSURANCE

# VIEWPOINT REPORT

## Food safety: What's next to assure its future?

FEBRUARY 2019

SAFER, SMARTER, GREENER

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**IN THE SPOTLIGHT**

# Introduction

Food safety continues to be a topic of high attention and debate worldwide. According to a 2018 factsheet from the World Health Organization (WHO), over 200 diseases are spread through food. One in 10 people fall ill every year from eating contaminated food and 420,000 people die each year as a result. Children under 5 years of age are at particularly high risk, with some 125,000 young children dying from food-borne diseases every year.

Moreover, the factsheet states, an increasing number of potentially harmful bacteria is becoming resistant to drug treatment while globalization is making food safety even more complex, yet vital, to implement.

On-farm production, early processing (slaughtering or harvesting), storage, transport and distribution are mentioned by WHO among the stages along the food value chain where contamination is more likely to happen, making food safety a multi-sector and multidisciplinary concern*. In the fourth quarter of 2018 alone, the WHO secretariat in charge of food safety (INFOSAN) was involved in 19 food safety events affecting 65 member states from all regions: Europe (29), followed by the Americas (15), Africa (9), the Western Pacific (9), the Eastern Mediterranean (4) and finally South-East Asia (2)**.

According to another report from the World Bank***, "the costs of unsafe food are high – especially in Asia and Sub-Saharan Africa, which have the highest incidence of food-borne diseases. Aside from public health costs and the loss of productivity associated with food-borne diseases, disruptions to food markets and impediments to agri-food exports due to food safety problems also take a toll [in terms of human lives]. The good news is that much of the burden of unsafe food can be avoided through practical and often low-cost behaviour and infrastructure changes at different points along food value chains, including in traditional food production and distribution channels."

To help shed light on these issues and contribute to provide improvement, DNV GL – Business Assurance and The Global Food Safety Initiative (GFSI) partnered to run a survey amongst food & beverage industry players. This report presents the results and offers insights into the industry mindset and approach to food safety and third-party certification.

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* https://www.who.int/features/factfiles/food_safety/en/
** https://www.who.int/foodsafety/areas_work/infosan/INFOSAN-QS4/en/
*** The Safe Food Imperative Accelerating Progress in Low- and Middle Income Countries, World Bank, 2019

# Methodology and survey sample

The survey was conducted in November and December 2018 involving 1,643 professionals from food and beverage companies throughout the value chain in Europe, North America, Central & South America and Asia.

The sample consists of DNV GL – Business Assurance customers and customers certified to a GFSI-benchmarked certification programme. A total of 88% of the companies in the sample are certified against one of the GFSI-recognised certification programmes*.

The survey does not claim to be statistically representative of every company in the respective geographies, sectors and industries.

The questionnaire was administered using the CAWI (Computer Assisted Web Interviewing) methodology.

| | |
|---|---|
| North America | 38.6% |
| Central and South America | 2.5% |
| Europe | 48.7% |
| Asia | 8.8% |
| Other | 1.4% |

**Figure 1:** Geographic distribution of companies in the sample

## Attributes of companies in the LEADERS group

**A total of 241 companies in the sample were identified as LEADERS based on a list of attributes defined by the project team:**

- companies that consider food safety important to a great extent for the company's overall business strategy;
- companies that currently define themselves as leading in food safety management;
- companies that are going to invest in food safety equally or more than today 3 years from now.

LEADERS represent 15% of the total respondents; the analysis of their answers offers insights into the best practices and mindset of the companies with more mature approaches to food safety.

* https://www.mygfsi.com/certification/recognised-certification-programmes.html


**Figure 2:** Companies in the sample by size (no. of employees) and industry

# Notes to the reader

- Green circles in charts highlight significantly above average data. Red circles highlight significantly below average data.
- DK/DA represents "do not know" and/or "did not answer".
- The charts report scores obtained by the total number of respondents, by geographies, by companies certified to a GFSI standard and by LEADERS.
- When the sample is very low (less than 50 respondents), the numbers are less statistically significant and comments should be considered accordingly.
- The charts in the Appendix report scores obtained by size and scores obtained by food & beverage industry sectors (i.e. small companies and large companies).
- When the term LEADERS refers to the group of companies featuring the above-mentioned attributes, it always appears in capital letters.
- The term small companies reported in charts refers to companies with 50 employees or fewer.
- The term large companies reported in charts refers to companies with over 1,000 employees.
- For the reader's convenience, the word "average" is used throughout the text to indicate mean scores for all respondents.
- In the report, "consumer" refers to the person consuming the food, while "customer" refers to the entity (most often a business) buying from the companies answering the survey.

# MAIN RESULTS

## Focus on protecting consumers and complying with regulations

Players in the food & beverage industry are well aware of the overall importance of food safety. Consumers' well-being and compliance with regulations are their main concerns.

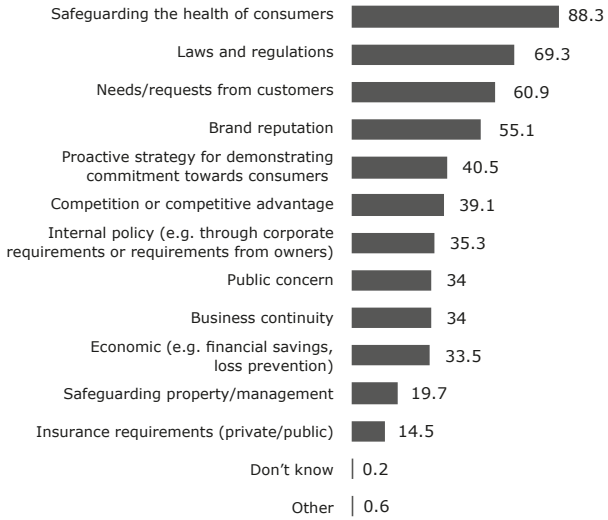
Protecting consumers is definitely the most important factor to the respondents, across all sectors, company sizes and geographies (88%), followed by compliance with laws and regulations (69%) while customer requirements (61%) rank third. Conversely, commercial benefits generally rank low (40% and below), indicating that ensuring food safety is perceived as a prerequisite for good business practice rather than a competitive advantage.

Although consumers and compliance are key aspects for the whole food & beverage industry, there are other trends that stand out. Large companies, for instance, selected a broader range of reasons amongst the different options, showing that they recognise the wider impact of food safety.

It is also worth highlighting that, while European respondents scored very high on the top 3 options (especially on customer requirements), Central & South America and Asia's answers are more diverse. This illustrates that the motivations to produce safe food are slightly more diverse in those regions than in Europe.

There are many possible reasons to focus on food safety in an organization. Why is food safety important for your company?

**Figure 3:** Reasons for food safety focus




| | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|
| | 728 | 577 | 37 | 131 | 1,453 | 241 |
| Safeguarding the health of consumers | 91.9% | 85.4% | 89.2% | 84.7% | 89.6% | 96.3% |
| Laws and regulations | 70.6% | 66.9% | 54.1% | 83.2% | 70.0% | 64.7% |
| Needs/requests from customers | 65.1% | 56.2% | 56.8% | 60.3% | 63.0% | 61.0% |
| Brand reputation | 49.3% | 57.7% | 75.7% | 60.3% | 55.2% | 64.3% |
| Proactive strategy for demonstrating commitment towards consumers | 32.4% | 48.5% | 35.1% | 50.4% | 40.8% | 50.2% |
| Competition or competitive advantage | 34.1% | 41.4% | 59.5% | 46.6% | 39.8% | 40.2% |
| Internal policy (e.g. through corporate requirements or requirements from owners) | 35.7% | 32.9% | 59.5% | 38.9% | 35.7% | 44.8% |
| Public concern | 30.8% | 37.6% | 24.3% | 36.6% | 34.9% | 40.2% |
| Business continuity | 28.2% | 37.3% | 54.1% | 38.2% | 34.4% | 40.7% |
| Economic (e.g. financial savings, loss prevention) | 31.0% | 37.4% | 27.0% | 29.0% | 33.9% | 36.5% |
| Safeguarding property/management | 17.4% | 20.8% | 32.4% | 19.8% | 20.5% | 31.5% |
| Insurance requirements (private/public) | 12.6% | 17.0% | 13.5% | 9.9% | 14.9% | 17.0% |
| Don't know | 0.0% | 0.3% | 0.0% | 0.8% | 0.2% | 0.0% |
| Other | 0.4% | 0.3% | 2.7% | 1.5% | 0.6% | 1.2% |

### GOING BEYOND WHAT'S GIVEN

LEADERS give greater importance to several items, such as business continuity and public concern, suggesting that they recognise the wider business benefits from focusing on food safety.

# Food safety culture on the rise

When questioned on risks, 77% of the respondents understandably identified operational risks (e.g. chemical, physical, microbiological contamination) as the main threats to food safety. Lack of food safety culture ranked second and was selected by 31% of the respondents, before compliance with regulation (28%) and lack of supply chain management (21%).

The sectors to which the companies belong seem to affect their risk perception, as well. Manufacturing companies (i.e. food processing) are more focused on operational risks, while retail and wholesale businesses are more worried about the lack of supply chain management and lack of competence in the food safety area*, probably due to the nature of their business.

Please select the main risk areas in your company related to food safety.

**Figure 4:** Main risk areas related to food safety


| Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|
| *728* | *577* | *37* | *131* | *1,453* | *241* |
| 82.4% | 71.4% | 70.3% | 69.5% | 78.7% | 88.4% |
| 25.3% | 33.3% | 59.5% | 35.1% | 29.9% | 16.2% |
| 31.2% | 24.6% | 24.3% | 29.0% | 27.5% | 30.3% |
| 20.3% | 17.7% | 35.1% | 35.9% | 20.9% | 20.7% |
| 19.5% | 16.1% | 16.2% | 35.1% | 18.4% | 13.7% |
| 18.8% | 13.9% | 32.4% | 31.3% | 18.6% | 21.6% |
| 19.6% | 12.5% | 21.6% | 27.5% | 18.7% | 24.1% |
| 9.1% | 8.7% | 16.2% | 22.9% | 10.4% | 12.9% |
| 8.0% | 4.3% | 0.0% | 8.4% | 6.4% | 11.6% |
| 1.4% | 3.3% | 5.4% | 3.1% | 2.1% | 2.5% |
| 1.5% | 4.2% | 0.0% | 2.3% | 2.3% | 0.4% |

## AHEAD WITH FOOD SAFETY CULTURE

Lack of food safety focus is not a risk for LEADERS. They appear to pay higher attention to many items that score lower in the general sample, including food fraud and opposition from influential stakeholder groups. They have already built needed competence and are more aware of the impact of food safety risks on business continuity, their stakeholders and the public.

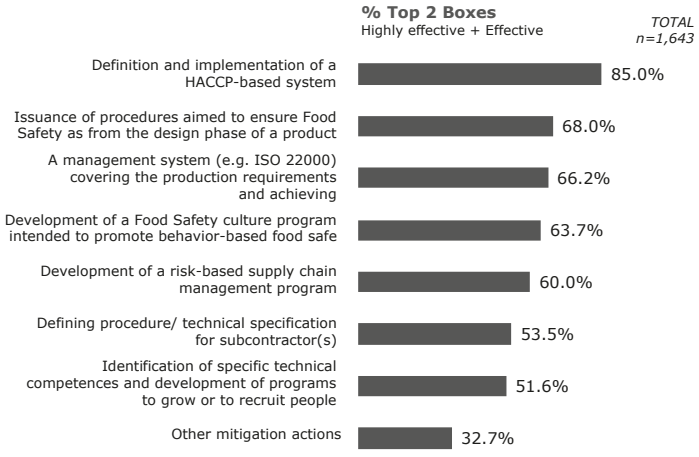
* See appendix page 39

The most effective actions taken by the companies to mitigate risks focus on food safety systems: HACCP (85%), procedures to ensure food safety as early as the design stage of a product (68%) and a management system (e.g. ISO 22000) covering the production requirements and achieving continuous improvement (66%). Not far behind, food safety culture is in fourth position, indicating that implementing such a culture is on the rise.

Almost all items rank above 50%, which suggests many companies are undertaking a range of actions that prove to be effective. The effectiveness of actions varies among the different sectors. Management systems score higher for food manufacturers, while supply chain programmes prove to be more effective for retailers/wholesalers (see appendix page 39).

**Please select the planned or undertaken actions so far to evaluate or mitigate the above identified risks, and rate the actions based on the evaluation scale below.**

**Figure 5:** Risk-mitigation actions effectiveness



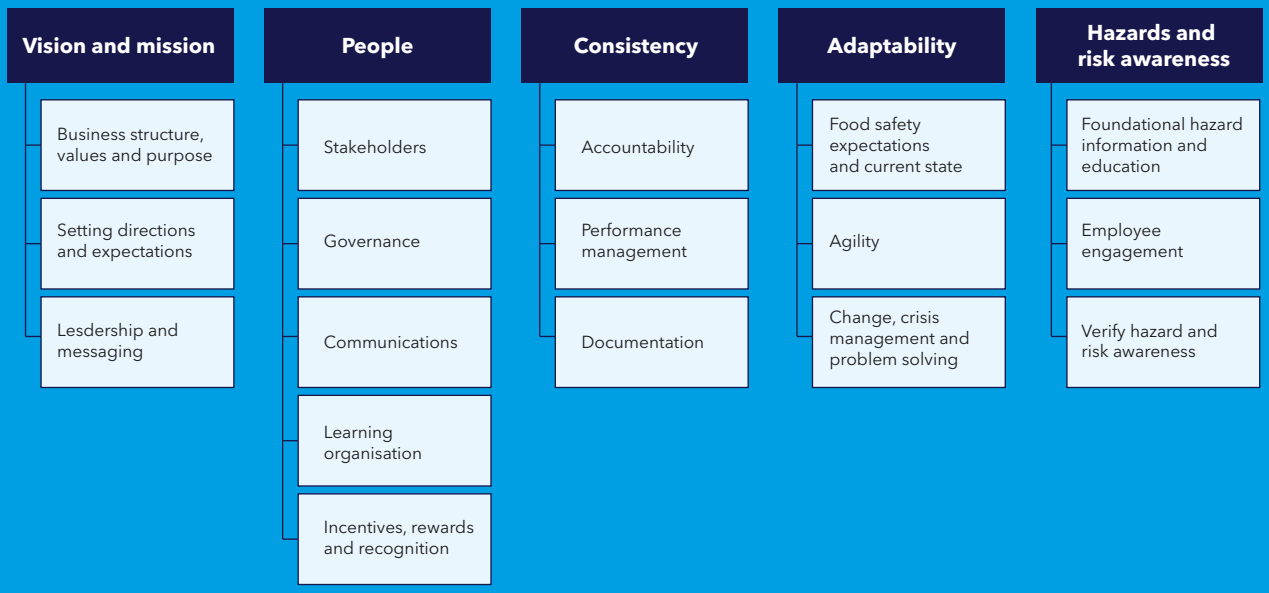

| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* |
| Definition and implementation of a HACCP-based system | 85.0% | 92.9% | 76.6% | 86.5% | 84.7% | 87.9% | 97.1% |
| Issuance of procedures aimed to ensure Food Safety as from the design phase of a product | 68.0% | 72.3% | 63.1% | 86.5% | 68.0% | 69.9% | 88.4% |
| A management system (e.g. ISO 22000) covering the production requirements and achieving | 66.2% | 73.0% | 55.4% | 81.0% | 80.2% | 68.6% | 83.8% |
| Development of a Food Safety culture program intended to promote behavior-based food safe | 63.7% | 66.1% | 61.5% | 72.9% | 62.6% | 64.9% | 88.0% |
| Development of a risk-based supply chain management program | 60.0% | 61.4% | 57.1% | 70.2% | 55.0% | 61.1% | 80.0% |
| Defining procedure/ technical specification for subcontractor(s) | 53.5% | 58.1% | 47.6% | 64.8% | 51.9% | 55.0% | 76.7% |
| Identification of specific technical competences and development of programs to grow or to recruit people | 51.6% | 56.2% | 43.9% | 75.6% | 51.2% | 52.9% | 75.9% |
| Other mitigation actions | 32.7% | 31.0% | 33.2% | 51.3% | 35.9% | 33.8% | 43.6% |

## TOWARDS A HOLISTIC APPROACH

LEADERS rank higher than the average for all actions. They seem to adopt more and a wider range of actions. It is noteworthy that LEADERS rank food safety culture programmes third. They are ahead of the general sample in implementing food safety culture programmes.

# Challenging complexity with culture

**The five dimensions and critical components of food safety culture:**




**The complexity of the food supply chain is at an all-time high. Heightened expectations come with heightened risks, and the food industry is investing more and more into food safety systems to ensure risk management at all levels of the food production, processing and distribution chains. Facing the ever-evolving challenges of safely feeding the planet requires going above and beyond traditional compliance approaches. Having the right standards in place, with the right management systems and the right auditing regimes seems to be only the first step. The food industry is becoming increasingly aware that the best requirements and systems cannot succeed without a strong food safety company culture.**

Many organizations are facing the challenge of qualifying and consistently strengthening their food safety culture. In fact, many discussions are being held and papers being written about building a strong food safety culture, yet limited agreement exists on what food safety culture is. In its publication, *A culture of Food Safety*, GFSI states that *"culture draws its power from the unspoken and intuitive, from simple observation, and from beliefs as fundamental as 'This is the right thing to do' and 'We would never do this'. Rules state facts; culture lives through the human experience". Drawing from this concept, the publication goes on to defining food safety culture as a set of "shared values, beliefs and norms that affect mindset and behaviour toward food safety in, across and throughout an organization"*. These comments and definitions demonstrate the power of culture to complement systems.

Focusing on being pragmatic and helpful to the industry, the GFSI publication gives a framework defining key dimensions to building a food safety culture, with guiding questions for each element of the dimensions; companies may run a self-diagnosis and build a food safety culture plan from the conversations they will have around the guiding questions.

**Reference: GFSI, 4/11/2018; https://www.mygfsi.com/images/A_Culture_Of_Food_Safety/GFSI-Food-Safety-Culture-FULL-VERSION.pdf**

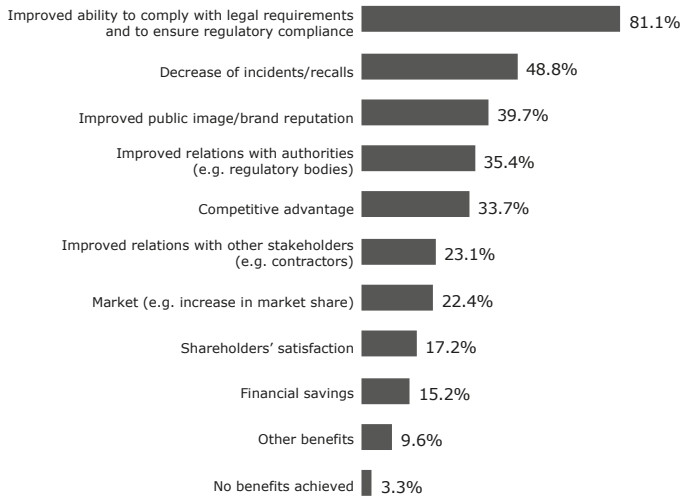
# Benefits from food safety initiatives

Among benefits companies achieve from the risk-mitigating actions undertaken, compliance with legal and regulatory requirements ranks far above other factors at 81%. At a distance, decrease of incidents/recalls and improved public image/brand reputation complete the top 3 list. Food safety regulation is clearly at the forefront of industry concerns and requirements in HACCP and procedures, such as food safety management systems, help address regulatory compliance and decrease incidents.

In Asia the top 3 benefits are the same but scores are higher than the general sample. It is worth noting that, in those regions, governments are making food safety a key priority and have worked to significantly strengthen their national food control systems in recent years.

What benefits did your company achieve from the risk mitigation actions undertaken?

**Figure 6:** Benefits from risk mitigation actions




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | | *728* | *577* | *37* | *131* | *1,453* | 241 |
| Improved ability to comply with legal requirements and to ensure regulatory compliance | 81.1% | 83.4% | 77.8% | 89.2% | 84.7% | 83% | 88% |
| Decrease of incidents/recalls | 48.8% | 52.7% | 42.3% | 45.9% | 54.2% | 50% | 61% |
| Improved public image/brand reputation | 39.7% | 40.0% | 34.3% | 48.6% | 51.9% | 40% | 49% |
| Improved relations with authorities (e.g. regulatory bodies) | 35.4% | 38.9% | 31.2% | 24.3% | 31.3% | 36% | 45% |
| Competitive advantage | 33.7% | 30.4% | 32.6% | 56.8% | 45.8% | 35% | 44% |
| Improved relations with other stakeholders (e.g. contractors) | 23.1% | 25.5% | 16.8% | 24.3% | 33.6% | 24% | 31% |
| Market (e.g. increase in market share) | 22.4% | 22.8% | 17.7% | 16.2% | 35.1% | 23% | 28% |
| Shareholders' satisfaction | 17.2% | 17.6% | 15.6% | 29.7% | 16.8% | 18% | 26% |
| Financial savings | 15.2% | 14.0% | 15.3% | 16.2% | 19.1% | 15% | 21% |
| Other benefits | 9.6% | 6.2% | 12.8% | 10.8% | 10.7% | 10% | 11% |
| No benefits achieved | 3.3% | 2.5% | 5.7% | 0.0% | 0.0% | 3% | 2% |

## MORE EXPERIENCE, MORE BENEFITS

LEADERS score higher for almost all items. They seem to derive a more holistic set of benefits achieved from their risk mitigation actions.

# Increasingly relevant to the business strategy

Food safety is relevant to the business strategy for 90% of the sample. However, only 63% consider it relevant to a great extent, which seems to suggest that addressing consumer health and compliance operationally overshadow strategic processes.

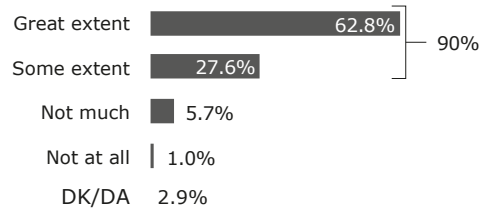
Strategic importance is expected to increase. The outlook 3 years from now shows an increase in great extent answers to 69% from today's 63% and a significant decrease for some extent to 18% from 28%. Virtually no company ranks food safety as not relevant to their business strategy.

Food producers and food retailers/wholesalers predict an increase in the relevance of food safety issues (see appendix page 40). This may be linked to the growing attention paid to topics such as supply chain management and transparency.

To what extent are food safety issues relevant to your company's overall business strategy?

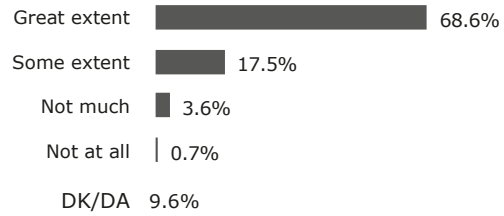
**Figure 7:** Relevance to business strategy

## Today




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI |
|---|---|---|---|---|---|---|
| | | *728* | *577* | *37* | *131* | *1.453* |
| Great extent | 62.8% | 64.4% | 60.0% | 67.6% | 58.8% | 64.7% |
| Some extent | 27.6% | 28.4% | 29.5% | 21.6% | 30.5% | 27.5% |
| Not much | 5.7% | 4.5% | 6.9% | 2.7% | 6.9% | 4.8% |
| Not at all | 1.0% | 0.7% | 1.2% | 0.0% | 2.3% | 0.8% |
| DK/DA | 2.9% | 0.4% | 1.0% | 2.7% | 0.8% | 2.2% |

## 3 years from now




| | | | | | |
|---|---|---|---|---|---|
| Great extent | 69.1% | 68.5% | 75.7% | 64.1% | 69.1% |
| Some extent | 20.1% | 15.3% | 10.8% | 22.1% | 18.2% |
| Not much | 3.0% | 4.2% | 0.0% | 5.3% | 3.0% |
| Not at all | 0.3% | 1.0% | 0.0% | 2.3% | 0.7% |
| DK/DA | 4.8% | 8.3% | 8.1% | 1.5% | 9.0% |

The industry is committed to advancing on food safety. Analysing maturity within food safety management, the share of companies calling themselves leading on a 5-point development scale is relatively low (22%) today. However, the picture improves 3 years from now, with about 1 out of 2 expecting to significantly advance their food safety management maturity.

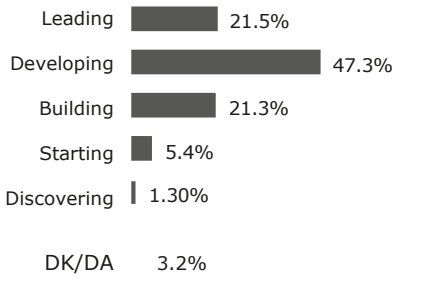
This projects a 27 percentage point increase in companies that consider themselves leading in 3 years from now.

Large companies are more mature than the general sample with higher percentages considering themselves leading both today and in 3 years (see appendix page 40).

From a food safety management maturity point of view, where would you position your company on a 5-point development scale?

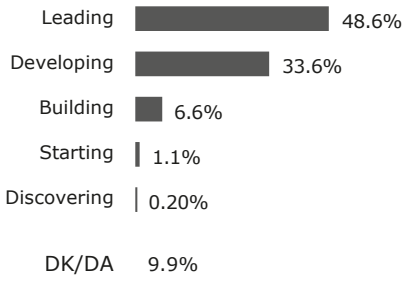
**Figure 8:** Food safety maturity

## Today




| Europe | North America | Central & South America | Asia | GFSI |
|---|---|---|---|---|
| *728* | *577* | *37* | *131* | *1,453* |
| 24.0% | 22.2% | 24.3% | 9.9% | 22.8% |
| 50.0% | 44.4% | 45.9% | 50.4% | 49.5% |
| 19.0% | 22.4% | 21.6% | 31.3% | 20.6% |
| 4.5% | 5.9% | 0.0% | 5.3% | 4.0% |
| 0.5% | 2.4% | 2.7% | 0.8% | 0.8% |
| 2.0% | 2.7% | 5.5% | 2.3% | 2.3% |

## 3 years from now




| | | | | |
|---|---|---|---|---|
| 45.2% | 53.2% | 75.7% | 38.9% | 49.5% |
| 37.8% | 28.6% | 16.2% | 45.0% | 34.1% |
| 7.4% | 5.9% | 2.7% | 6.1% | 6.1% |
| 0.8% | 1.2% | 0.0% | 3.1% | 1.0% |
| 0.3% | 0.0% | 0.0% | 0.0% | 0.1% |
| 8.5% | 11.1% | 5.4% | 6.9% | 9.2% |

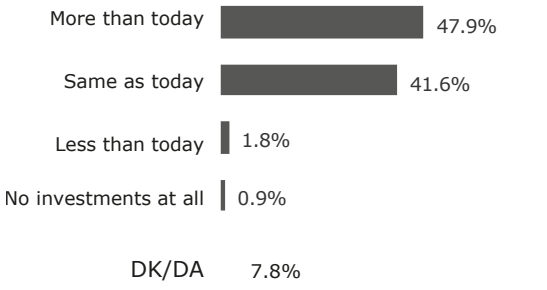
# Planning to continue investments in food safety

Regardless of their size, industry or geography, companies intend to continue their investments in food safety. A total of 42% answer that they will keep investing at the same level as today. Almost 1 in 2 companies plan to invest even more.

Asia stands out with a high intention to invest more than today (14 percentage points higher compared to the total sample), showing the strong commitments of companies in this region to improve food safety. Large companies will invest more than today and in higher proportions compared to small companies (see appendix page 41).

Is your company going to invest in food safety in the next 3 years?

**Figure 9:** Future investment in food safety




| | Europe | North America | Central & South America | Asia | GFSI |
|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* |
| More than today | 40.8% | 51.1% | 54.1% | 61.8% | 46.7% |
| Same as today | 50.4% | 37.6% | 37.8% | 28.2% | 43.8% |
| Less than today | 1.8% | 1.7% | 0.0% | 3.1% | 1.9% |
| No investments at all | 0.5% | 1.6% | 0.0% | 0.0% | 0.8% |
| DK/DA | 6.5% | 8.0% | 8.1% | 6.9% | 6.8% |

# Certification: a food safety passport

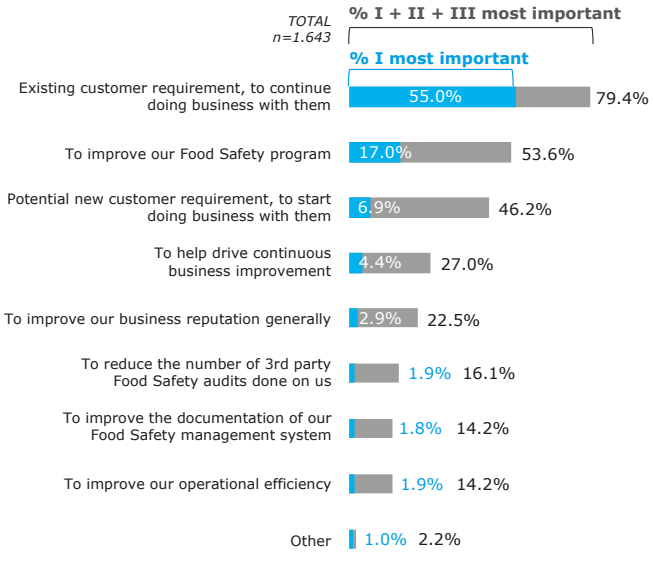
Existing and potential new customer requirements are among the top drivers for certifying food safety systems. Clearly, customers use certification to manage their suppliers and certification appears to be a ticket-to-trade in value chains where supplier assessments are stricter than ever.

Certification is also a way to improve food safety programmes for 54%. Overall, companies recognise the business value of certification, suggesting a combination of internal factors and drivers.

Large companies, however, appear to be more driven by internal factors (see appendix page 41). The same applies to respondents in Asia who chose internal factors, such as improvement of the food safety system and continuous business improvement, more often than the total sample. This suggests that Asian companies have a strong focus on food safety improvement, above and beyond the requirements of potential customers for instance.

Please rank the first three factors which led to the certification of your food safety system (or management system).

**Figure 10:** Drivers for food safety certification




| | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* |
| Existing customer requirement, to continue doing business with them | 84.5% | 79.6% | 81.1% | 62.6% | 85.2% | 77.7% |
| To improve our Food Safety program | 53.3% | 52.3% | 54.0% | 65.6% | 56.1% | 60.5% |
| Potential new customer requirement, to start doing business with them | 48.1% | 48.4% | 51.3% | 37.4% | 49.3% | 39.4% |
| To help drive continuous business improvement | 28.1% | 24.2% | 18.9% | 32.1% | 28.0% | 33.6% |
| To improve our business reputation generally | 24.3% | 21.0% | 16.2% | 25.9% | 23.3% | 24.0% |
| To reduce the number of 3rd party Food Safety audits done on us | 15.7% | 17.5% | 27.0% | 9.2% | 17.6% | 15.7% |
| To improve the documentation of our Food Safety management system | 14.2% | 14.5% | 5.4% | 17.6% | 14.7% | 16.2% |
| To improve our operational efficiency | 16.7% | 11.3% | 10.8% | 15.3% | 14.1% | 18.1% |
| Other | 1.7% | 2.5% | 0.0% | 3.8% | 1.9% | 1.2% |

## DRIVING IMPROVEMENTS

LEADERS rated food safety programmes and driving continuous business improvement higher than the overall sample, recognising the value of certification in supporting these two company objectives.

# The value of certification

When questioned on the different benefits derived from certifying their food safety systems, companies rated highly several aspects, confirming the many advantages of certification. This is even more pronounced in exporting regions such as Central & South America and Asia.

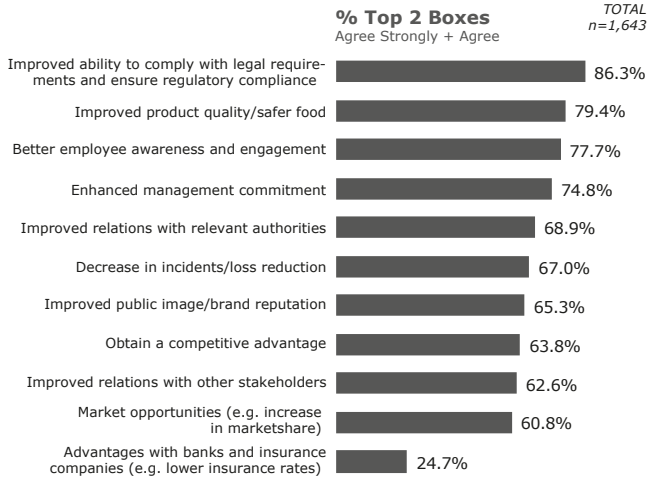
There is a match between risks companies perceive and the benefits obtained from certification. Answers appear to be aligned to those examining the main risk areas. For example, the top-ranking benefit matches the high-ranking risk compliance to laws and regulations (third place with 28%). This confirms that certification is a good tool to address main food safety risks.

Besides compliance, the other main benefits are improved product quality/safer food (79%) and better employee awareness and culture (78%), suggesting certification might also be an answer to the identified risk of a lack of food safety culture.

Some differences emerge. Product quality is an important benefit especially for companies operating in food production and packaging manufacturing. Large companies achieve less benefits in terms of external factors, while companies certified to a GFSI-benchmarked scheme are those that seem to be gaining most and show higher percentages for most benefits (see appendix page 41).

**A company may gain different benefits from certification of their food safety system. For your company, how much do you agree with the benefits listed below?**

**Figure 11:** Benefits from food safety certification




| Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|
| *728* | *577* | *37* | *131* | *1.453* | *241* |
| 90.4% | 82.3% | 86.5% | 87.8% | 91.1% | 90.4% |
| 81.2% | 74.9% | 86.5% | 89.3% | 83.4% | 87.1% |
| 80.8% | 74.9% | 86.4% | 79.4% | 82.1% | 88.0% |
| 77.7% | 71.9% | 83.7% | 75.6% | 79.0% | 87.1% |
| 71.0% | 68.1% | 70.2% | 65.6% | 72.9% | 79.6% |
| 68.2% | 61.7% | 83.8% | 77.8% | 70.2% | 79.2% |
| 64.7% | 64.3% | 81.0% | 68.0% | 68.7% | 79.6% |
| 61.2% | 64.6% | 83.7% | 68.0% | 67.3% | 73.5% |
| 63.5% | 58.3% | 83.7% | 67.2% | 66.2% | 76.8% |
| 58.9% | 61.3% | 72.9% | 63.3% | 64.2% | 71.0% |
| 19.0% | 28.8% | 35.1% | 30.5% | 26.1% | 34.4% |

## PREMIUM BENEFITS

LEADERS show values significantly above average for all benefits, confirming their holistic approach to food safety.

Beyond specific benefits, certification adds value to the entire organization and its stakeholders for 1 out of 2 respondents. Those who do not see a value are almost non-existent at only 1% (mainly small companies and businesses operating in the primary sector).

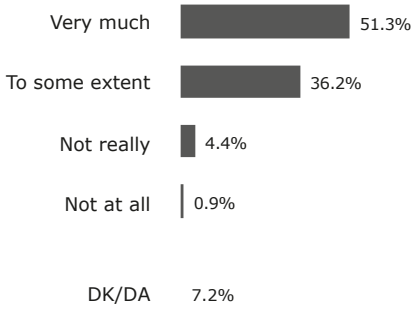
The share of those who do not know how to answer is low too, suggesting awareness of the value certification brings throughout the total sample.

## A HIGHER VALUE FROM CERTIFICATION

The difference between the general sample and LEADERS confirms that the LEADERS perceive a higher value from certification.

To what extent does certification of your food safety system add value to your organization and your stakeholders?

**Figure 12:** Value from certification




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* |
| Very much | 48.1% | 55.8% | 70.3% | 47.3% | 54.4% | 71.8% |
| To some extent | 42.9% | 29.6% | 18.9% | 40.5% | 38.1% | 22.4% |
| Not really | 3.7% | 5.4% | 0.0% | 3.8% | 4.5% | 2.1% |
| Not at all | 0.4% | 1.6% | 0.0% | 0.8% | 1.0% | 0.0% |
| DK/DA | 4.9% | 7.6% | 10.8% | 7.6% | 2.0% | 3.7% |

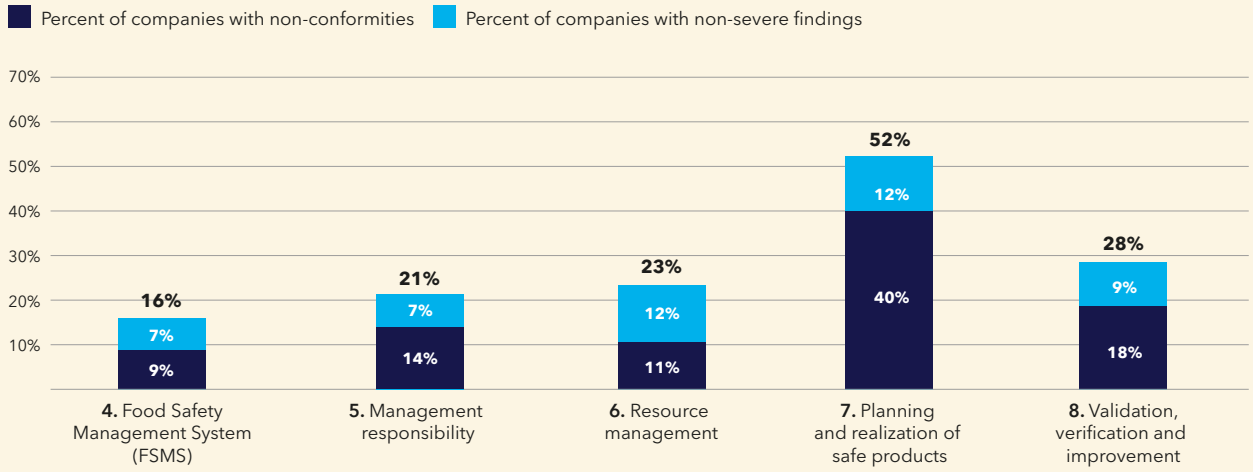
# Insights from auditing food safety management systems

**This section analyses data from audits performed by DNV GL in 2018 on food & beverage companies whose safety management systems were certified according to ISO 22000 and FSSC 22000. By quantitatively and qualitatively analysing the data, it provides insight into the aggregated performance of their management systems.**

The aim is to provide targeted insight as to which process areas, sub-processes or activities cause the most issues in organizations seeking to achieve and/or maintain certification to a food safety management system standard.

The results come from analysing audits conducted worldwide by DNV GL on over 1,200 ISO 22000-certified companies and over 1,600 FSSC 22000-certified companies.

# ISO 22000




**Graph 1:** Distribution of Findings – Overview (ISO 22000:2005)

**Results**

A total of 58% of ISO 22000-audited companies experienced at least one finding (any category) during the audit whilst 47% concluded the audit with at least one severe finding, i.e. with a major non-conformity (Cat1) or a minor non-conformity (Cat2). The predominant impact of operational issues becomes apparent when breaking down the analysis at process level according to the ISO 22000 structure (version 2005), as shown in graph 1.

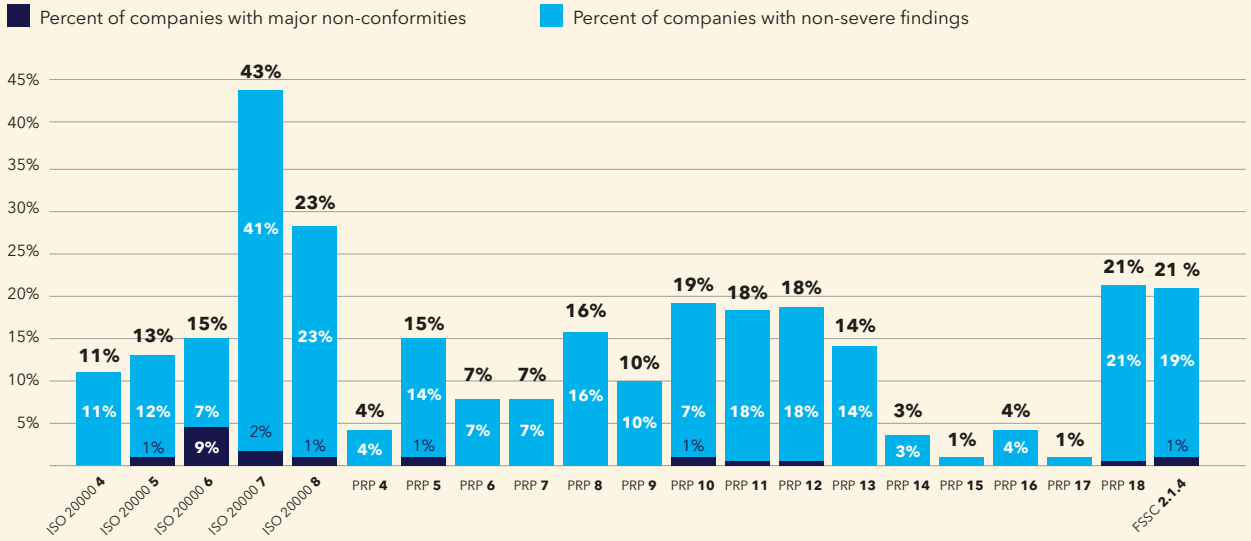
Over 50% of the companies had findings related to section 7 "Planning and Realization of Safe Food", and almost 40% had non-conformities. This is hardly a surprise, considering that this is the technical section where the pre-requisite programmes (PRPs) are identified and implemented, the hazard analysis is carried out, and the relevant control measures are identified and implemented through HACCP plan or the operational prerequisite programs (oPRPs).

Additional key operational items are also included in section 7, such as the traceability system, the control of non-conforming products (including product withdrawal/recall), and the verification of all the operational activities.

| Sub Process | Description | % frequency |
|---|---|---|
| 7.2 | Prerequisite programmes (PRPs) | 31% |
| 8.4.1 | Internal audit | 8% |
| 6.2.2 | Competence, awareness and training | 8% |
| 7.9 | Traceability system | 8% |
| 8.3 | Control of monitoring & measuring | 7% |
| 7.3.5 | Flow diagrams, process steps and control measures | 6% |
| 7.10.2 | Corrective actions | 5% |
| 7.5 | Establishing the operational prerequisite programmes (PRPs) | 4% |
| 4.2.2 | Control of documents | 4% |
| 7.4.2 | Hazard identification and determination of acceptable levels | 4% |

**Table 1:** Top 10 most frequent severe (non-conformity) failures per sub-process

# FSSC 22000




**Graph 2:** Distribution of findings – overview (fssc 22000 v4.1 And previous versions)

**Results**

A total of 59% of FSSC 22000-audited companies experienced at least one finding (any category) during the audit whilst 6% concluded the audit with at least one major non-conformity. The predominant impact of operational issues becomes apparent when breaking down the analysis at process level according to the FSSC 22000 V 4.1 structure (based on ISO 22000:2005 and ISO TS 22002-1), as shown in graph 2.

A total of 43% had non-conformities related to section 7 "Planning and Realization of Safe Food" and 23% had findings related to section 8 "Validation, Verification and Improvement of the FSMS". This is hardly a surprise due to the technical nature of these sections, and it is comparable to what we can observe for ISO 22000 (see analysis above). The percentage of non-conformities mirrors that of severe findings for ISO 22000.

The pattern for the two standards differ for the other findings. This is mainly because the detailed pre-requisite programs (PRPs) available in FSSC 22000 are not included in the ISO 22000 certification.

Notably for FSSC 22000, the highest impact is found within PRP 10, PRP 11 and PRP 12 (cross contamination, cleaning and sanitation, and pest control) and to the very specific PRP 18 (food defence) and FSSC 2.1.4 (additional FSSC requirements).

| Sub Process | Description | % frequency |
|---|---|---|
| PRP 18.1 | General Requirement - Food Defense, Biovigilance and Bioterrorism | 16% |
| 6.2.2 | Competence, awareness and training | 13% |
| 7.8 | Verification Planning | 12% |
| 7.9 | Traceability System | 12% |
| PRP 8.6 | Preventive and corrective maintenance | 12% |
| PRP 10.4 | Physical Contamination | 11% |
| 8.4.1 | Internal audit | 11% |
| 8.3 | Control of monitoring & measuring | 9% |
| FSSC 2.1.4.1 | Management of services | 8% |
| PRP 10.3 | Allergen Management | 8% |

**Table 2:** Top 10 most frequent severe (non-conformity) failures per sub-process

**GRAPH 2 LEGEND**

**ISO 22000 4:** Food Safety Management System **ISO 22000 5:** Management responsibility **ISO 22000 6:** Resource Management
**ISO 22000 7:** Planning and realization of safe products **ISO 22000 8:** Validation, Verification & Improvement of FSMS
**PRP 4:** Construction and Layout of Buildings **PRP 5:** Layout of Premises and Workspace **PRP 6:** Utilities – Air, Water, Energy
**PRP 7:** Waste disposal **PRP 8:** Equipment Suitability, Cleaning and Maintenance **PRP 9:** Management of purchased materials and services
**PRP 10:** Measures for Prevention of Cross Contamination **PRP 11:** Cleaning and Sanitizing **PRP 12:** Pest Control
**PRP 13:** Personnel hygiene and facilities **PRP 14:** General Requirement - Rework **PRP 15:** Product Recall Procedures
**PRP 16:** Warehousing and transportation **PRP 17:** Product information **PRP 18:** Food Defense, Biovigilance and Bioterrorism
**FSSC 2.1.4:** Additional requirements

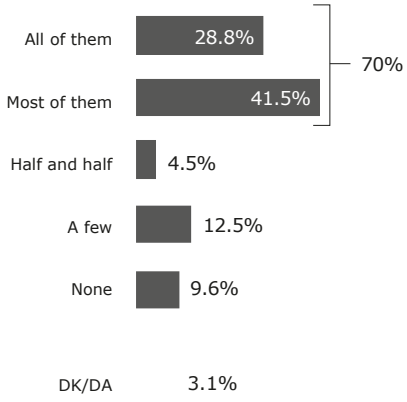
# Managing supply chains

When it comes to suppliers, 70% of respondents require all or most of them to be certified. Large companies tend to demand all suppliers to be certified.

As for the different sectors, food services and food retailers/wholesalers are among those that most often demand their suppliers to be certified (see appendix page 42).

Do you require your suppliers to be certified?

**Figure 13:** Certification of suppliers




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* |
| All of them | 27.6% | 31.9% | 2.7% | 18.3% | 29.9% | 39.8% |
| Most of them | 48.4% | 35.2% | 48.6% | 32.1% | 42.5% | 36.9% |
| Half and half | 4.3% | 5.4% | 0.0% | 6.1% | 4.7% | 4.1% |
| A few | 12.1% | 9.9% | 35.1% | 23.7% | 12.5% | 11.6% |
| None | 5.9% | 13.5% | 10.8% | 19.1% | 8.1% | 6.2% |
| DK/DA | 1.7% | 4.1% | 2.8% | 0.7% | 2.3% | 1.4% |

## A TENDENCY TO CERTIFY ALL SUPPLIERS

For LEADERS, certification is an important tool to manage their supply chains. They show a stronger tendency to have all their suppliers certified (11 percentage points higher compared to the total sample).

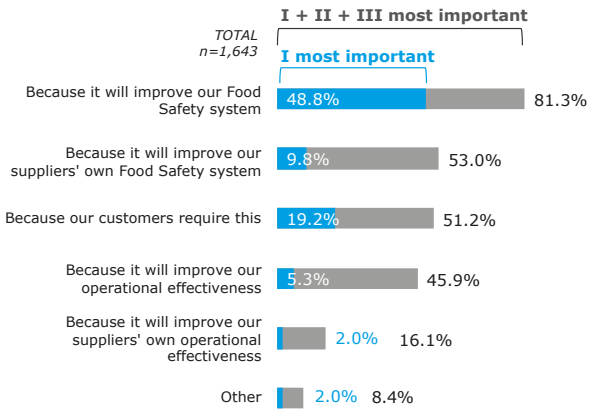
Companies were questioned on what factors were pushing them to require certification from their suppliers. The first driver is internal (company's own improvement). At a distance come external factors such as the desire to enhance suppliers' systems and satisfy customers' requirements.

Companies use supplier certification as a risk management tool of their own supply chain and to protect their business. This could be a response to the recent history of food safety incidents which have also highlighted the complexity of todays' supply chains.

This aspect is, for obvious reasons, less relevant for companies only operating in the primary sector or in packaging manufacturing (see appendix page 42). Overall, however, answers suggest that supplier certification is a way to protect and improve the business and safeguard its reputation.

Please rank the first three drivers / factors for your company requiring suppliers to be certified.

**Figure 14:** Drivers for supplier certification




| Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|
| *728* | *577* | *37* | *131* | *1,453* | *241* |
| 85.0% | 78.0% | 89.2% | 74.8% | 83.2% | 87.1% |
| 57.6% | 47.5% | 72.9% | 51.9% | 55.3% | 61.5% |
| 54.3% | 51.0% | 21.6% | 45.8% | 52.4% | 44.4% |
| 49.1% | 42.3% | 54.0% | 39.0% | 46.3% | 51.1% |
| 19.0% | 13.5% | 16.2% | 12.9% | 16.8% | 20.3% |
| 7.4% | 11.8% | 5.4% | 3.9% | 8.5% | 10.4% |

## BELIEVE IN SUPPLIER CERTIFICATION

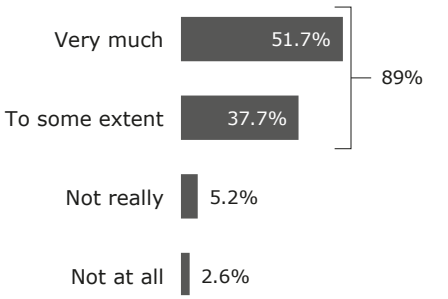
LEADERS' answers suggest that they are convinced adopters of supplier certification. They score higher for all drivers, but they appear to be less driven by customer factors.

Most of the respondents (89%) clearly see the benefits arising from supplier certification. However, differences among sectors can be perceived, with companies operating in food services benefitting the most and those in the primary sector the least.

Large companies tend to see value to a higher degree, possibly because they may have more complex supply chains (see appendix page 43).

To what extent is supplier certification beneficial to your company?

**Figure 15:** Value from supplier certification




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *1,643* | *728* | *577* | *37* | *131* | *1,453* | *241* |
| Very much | 51.7% | 51.6% | 51.8% | 70.3% | 48.1% | 52.3% | 64.7% |
| To some extent | 37.7% | 41.5% | 33.3% | 21.6% | 45.8% | 38.2% | 29.5% |
| Not really | 5.2% | 4.4% | 6.9% | 5.4% | 3.8% | 5.2% | 3.3% |
| Not at all | 2.6% | 1.4% | 5.4% | 0.0% | 0.0% | 2.6% | 1.2% |
| DK/DA | 2.8% | 1.1% | 2.6% | 2.7% | 2.3% | 1.7% | 1.3% |

## A CLEAR VIEW OF BENEFITS

LEADERS clearly see the benefits from supplier certification, answering "very much" almost 13 percentage points higher than the average.

More confidence in the supplier/products is the benefit (73%) ranked highest, followed by safer products (67%) and compliance to specifications/ meet our requirements (65%). Supplier certification thus proves to be an efficient tool for producing safer food, while monitoring the supply chain.

Once again, retailers/wholesalers and companies in food services are those obtaining the most benefits, while the primary sector perceives less advantages (see appendix page 43).

What are the main benefits for your company from supplier certification?

**Figure 16:** Benefits from supplier certification


| | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1.453* | *241* |
| More confidence in the supplier / products | 75.0% | 67.9% | 89.2% | 74.0% | 73.6% | 78.4% |
| Safer products | 66.6% | 61.9% | 91.9% | 84.7% | 67.1% | 71.8% |
| Compliance to specifications / meet our requirements | 66.9% | 60.7% | 73.0% | 67.9% | 66.0% | 66.8% |
| Supplier approval process / verification of suppliers / vendors | 53.2% | 53.2% | 67.6% | 54.2% | 55.4% | 62.7% |
| Certified to a recognized standard | 46.3% | 45.9% | 48.6% | 41.2% | 47.0% | 46.9% |
| Good documentation | 46.0% | 42.8% | 27.0% | 38.2% | 43.6% | 49.8% |
| Reduces audit time / cost / fewer audits | 46.8% | 34.7% | 59.5% | 46.6% | 43.1% | 49.8% |
| Better quality | 37.9% | 40.4% | 59.5% | 64.9% | 41.7% | 47.7% |
| Fewer issues with suppliers / products | 38.2% | 41.8% | 54.1% | 55.0% | 41.4% | 50.6% |
| Other | 1.0% | 0.9% | 2.7% | 0.8% | 0.8% | 1.2% |
| DK/DA | 0.7% | 3.3% | 0.0% | 0.8% | 1.6% | 0.0% |

## WIDE RANGE OF BENEFITS

LEADERS seem to be able to better capture benefits from supplier certifications and in multiple dimensions.

# Sustainable supply chain management in the food & beverage industry

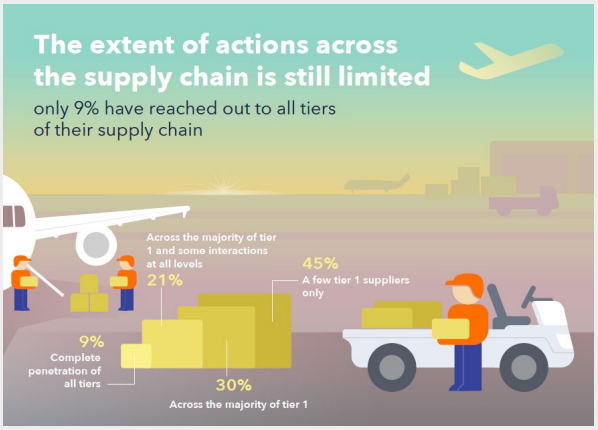
**Companies continue to face increasing demands to prove that they take sustainability into account across their entire value chain. In January 2018, supported by Supplier Ethical Data Exchange (Sedex), a non-profit organization that operates the world's largest collaborative platform for sharing responsible sourcing data on supply chains, we surveyed how companies are approaching supply chain sustainability and how mature they are in their approach. Our aim here is to provide the main results for companies in the Food & Beverage (F&B) industry.**

When asked which specific aspects respondents consider relevant for a supply chain to be sustainable, over half of the food & beverage companies answered low environmental impact (57%), followed by workplace health and safety (43%), the robustness of financial management (38%) and ethics (34%).


When it comes to buying decisions, sustainability in supply chains is important to 9 in 10 and to a great extent to more than 1 in 3 of the food & beverage companies surveyed. Out of these 89% felt pressured to manage their supply chain in a more sustainable way: the top 3 drivers being customers (75%), regulators and authorities (43%, +10 percentage points compared to the general sample) and final consumers (38%, +17 percentage points compared to the general sample).

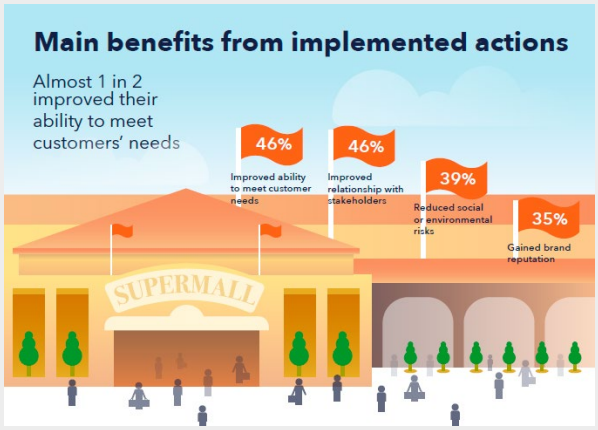

A total of 85% (+5 percentage points compared to the general sample) say their companies have taken at least one action to improve their supply chain sustainability. Initiatives undertaken are mainly self-conducted: 41% have directly undertaken an audit of some suppliers, 39% have required suppliers to provide information, 37% have implemented and communicated a sustainable policy and 36% have started a dialogue with suppliers to address these challenges.

When questioned about the extent of their actions, only 9% (+2 percentage points compared to the general sample) declare they have reached out to all tiers of their supply chain. The range of self-conducted actions and initiatives seem to have limited penetration into the supply chain, even if slightly higher in comparison to the general sample. Still a total of 45% of the food & beverage companies have reached out to a few tier 1 suppliers, only.




Main aspects addressed in their supply chain to improve sustainability are well balanced and span among the following main factors: workers' health & safety (53%), energy use and waste generation (both at 51%, +13 percentage points compared to general sample) followed by supply chain risk assessment initiatives (50%).

As a consequence, almost 1 in 2 food & beverage companies improved their ability to meet customers' needs by implementing sustainability in their supply chain as well as improved relationships with stakeholders. A total of 39% reduced social or environmental risks whilst 35% gained in brand reputation.




Overall, 74% of the food & beverage companies experienced benefits from the implemented actions to be greater or equal to costs. When asked to assess their sustainability maturity with a three-year horizon, they expect to improve and 78% foresee increased pressure 3 years from now to demonstrate a more sustainable supply main. The increased pressure will be addressed; 93% of the food & beverage companies will either increase or keep the same level of investments in supply chain sustainability.

Our study reveals that the building of sustainable supply chains has moved from being voluntary based on unstructured initiatives, i.e. self-conducted actions, to a more formal, structured approach. This is due to increasing laws and regulations combined with recognised initiatives with ambitious global goals, such as the Paris Agreement and the UN Sustainable Development Goals (SDGs) or the ISO 20400 standard on Sustainable Procurement. Within this context, companies able to approach actions in a strategic, structured and holistic way will benefit and be able to manage their supply chain risks better and build a sustainable supply chain performance penetrating all tiers.

## Want to know more on this topic?

Read the full Viewpoint report on our website: **https://www.dnvgl.com/assurance/viewpoint**

# Today's survey results versus the 2014 efficacy study by CGF/GFSI

**The Consumer Goods Forum/GFSI Efficacy Study 2014* provided useful insights into the topic of the impact of GFSI's work in improving food safety and business impacts experienced as a result of being certified.**

Some of the questions from the CGF/GFSI Efficacy Study 2014 were asked again in this 2018 survey. Although the two surveys followed different protocols and used different samples, a qualitative comparison of the answers is nonetheless possible and useful. In 2018, as in 2014, the top key drivers are customer requirements, improving food safety management systems and employee awareness.

When asked whether a certification of their food safety system adds value to their organization and their stakeholders, 87% responded positively in the 2018 survey, on par with 2014. The key benefits from certification include, in both years, the ability to comply with and prepare for regulatory changes; the production of safer food, which ranked last with 61% of respondents in 2014, ranked second in 2018. Between the two surveys, certification has convinced a larger proportion of the industry of its ability to protect food safety.

Likewise, the main consequence was more consistency in their operations and documentation in both surveys. However, the 2018 survey rated it higher. A similar pattern seems to exist for the runner-up, "improvements and time savings in their internal audit process", which had a higher ranking in 2018. "Significantly higher cost of production for their business" was ranked among the top 3 in 2018 but not in 2014. This could mean that companies are willing to undergo the certification process due to the benefits even if it increases costs.

Compared results also seem to show that companies use certification along the supply chain to a higher degree today than four years ago. When asked if they required their suppliers to be certified, as many as 70% of respondents in 2018 confirmed that all or some of their suppliers were required to be certified. This is a significant increase from the answers to the same questions in 2014, when only 40% responded yes.

The top 3 drivers for this particular item seemed to be the same in 2018 and 2014: "because it will improve our food safety system", "because it will improve our suppliers' own food safety system" and "because our customers require this". There was a switch and rebalance of the second and third position, with the improvement to the suppliers' own food safety system" taking second rank in 2018 ahead of customer requirements.

When subsequently asked to what extent supplier certification is beneficial to their company, the answers were positive in both surveys, but reinforced in 2018. The pattern in the top 3 benefits changed, though: in 2014, "reduced audit cost" topped the ranking. In 2018, this is much lower down the list, "more confidence in the supplier/the product" is the most often selected benefit by respondents.

The trends identified in these questions could be a sign of higher attention to the supply chain and its potential impact on food safety, and of the value of certification to manage food safety risk along the supply chain.

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* GFSI Efficacy Study 2014: https://www.mygfsi.com/news-resources/information-kit/information-kit-accordion/374-gfsi-efficacy-study-2014.html

# Food safety and new digital technologies

Do food & beverage companies have a sense of the importance of new digital technologies to enhance food safety but are not too sure about specific practical applications, yet? This could explain the high rate of those answering to some extent when asked about how new digital technologies could enhance food safety.

The responses seem to indicate that a majority of food & beverage companies are still exploring how new digital technologies can be used to enhance food safety, e.g. in their own operations or supply chains. Asian companies seem to see more opportunities than other geographies.

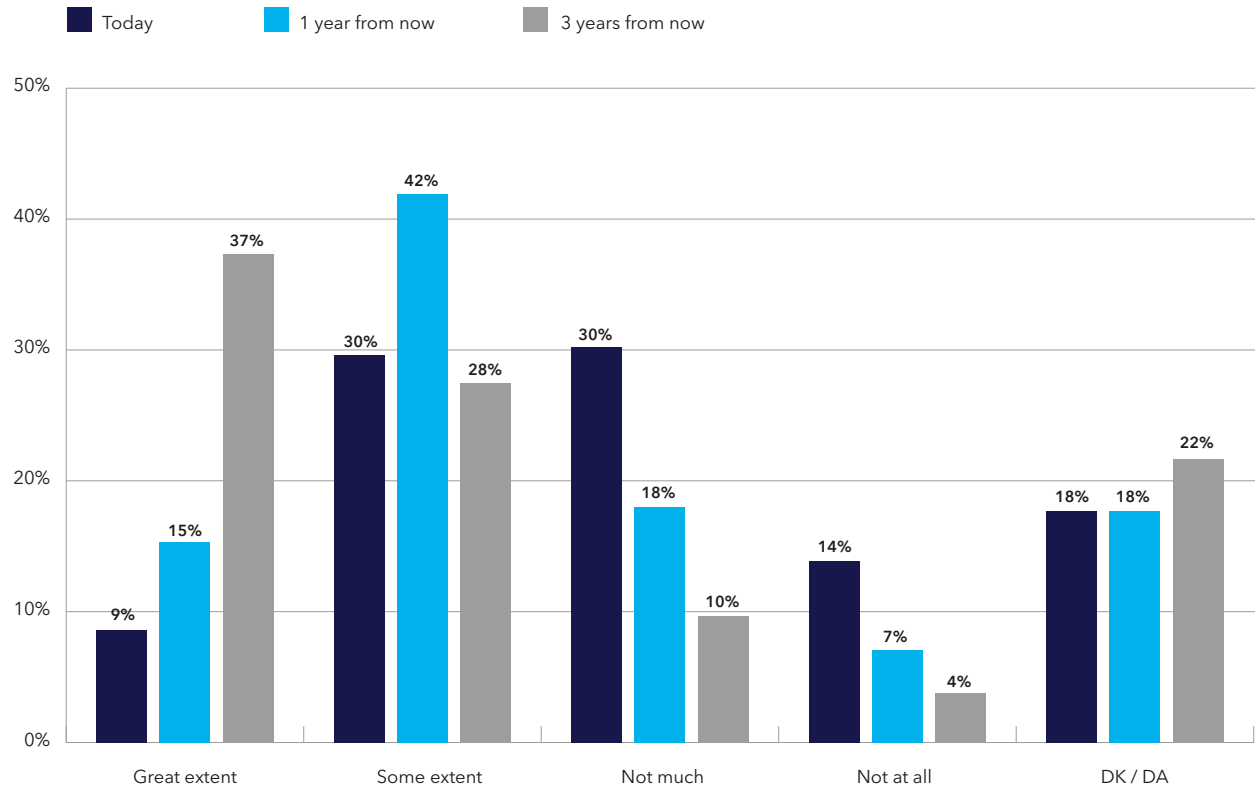
The two sectors food service and storage & distribution appear to have come farther, as well (see appendix page 43–44).

At an aggregate level, less than 1 out of 10 think that new digital technologies contribute to enhance food safety in their company. There is a limited increase to 15% in 1 year, while in 3 years the development is more significant with almost 4 out of 10 seeing digitalization supporting food safety.

However, the high share of respondents who did not answer this question could indicate that they do not have a clear picture of how to practically apply or combine new digital technologies to enhance food safety.

**To what extent do you think that new digital technologies (e.g. big data analytics, IoT, sensors, Blockchain, smart tags) contributes or will contribute to enhance food safety in your company?**

**Figure 17:** Importance of new digital technologies – summary



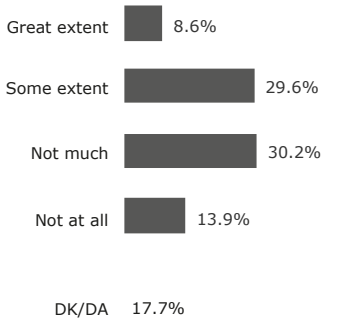

## MORE POSSIBILITIES

LEADERS seem to see more possibilities as to how they can apply new digital technologies to enhance their food safety efforts, both today and in 3 years from now.

To what extent do you think that new digital technologies (e.g. big data analytics, IoT, sensors, Blockchain, smart tags) contributes or will contribute to enhance food safety in your company?

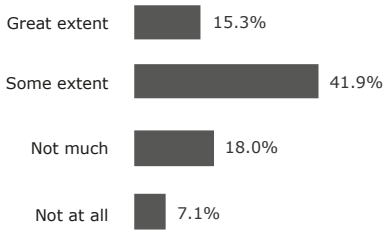
**Figure 18:** Importanceofnew digital technologies

## Today



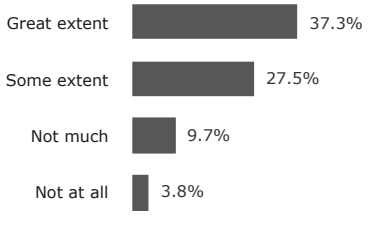

| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* | |
| Great extent | 8.6% | 6.5% | 9.5% | 10.8% | 13.7% | 8.2% | 17.0% |
| Some extent | 29.6% | 30.9% | 26.0% | 29.7% | 35.9% | 30.4% | 36.1% |
| Not much | 30.2% | 32.3% | 30.0% | 27.0% | 27.5% | 30.8% | 25.3% |
| Not at all | 13.9% | 14.4% | 16.5% | 5.4% | 7.6% | 13.8% | 8.3% |
| DK/DA | 17.7% | 15.9% | 18.0% | 27.1% | 15.3% | 16.8% | 13.3% |

## 1 year from now




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* | |
| Great extent | 15.3% | 13.9% | 14.9% | 24.3% | 20.6% | 15.1% | 26.1% |
| Some extent | 41.9% | 40.1% | 43.8% | 43.2% | 45.8% | 42.2% | 40.7% |
| Not much | 18.0% | 20.2% | 16.8% | 10.8% | 13.7% | 18.7% | 14.5% |
| Not at all | 7.1% | 6.7% | 9.2% | 2.7% | 5.3% | 6.7% | 4.1% |
| DK/DA | 17.7% | 19.1% | 15.3% | 19.0% | 14.6% | 17.3% | 14.6% |

## 3 years from now




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* | |
| Great extent | 37.3% | 32.0% | 40.6% | 54.1% | 46.6% | 36.9% | 47.7% |
| Some extent | 27.5% | 31.0% | 23.6% | 24.3% | 30.5% | 28.6% | 22.4% |
| Not much | 9.7% | 10.2% | 10.6% | 2.7% | 6.1% | 10.1% | 7.5% |
| Not at all | 3.8% | 3.0% | 5.9% | 0.0% | 3.1% | 3.6% | 2.1% |
| DK/DA | 21.7% | 23.8% | 19.3% | 18.9% | 13.7% | 20.8% | 20.3% |

Sensors and beacons are indicated as the most relevant new digital technologies supporting food safety according to the surveyed companies (44%) followed by blockchain (15%). Smart tags and labels rank third. It is worth noticing that, even though they could be implemented without being combined with other technologies, artificial intelligence and machine learning score a mere 2%.

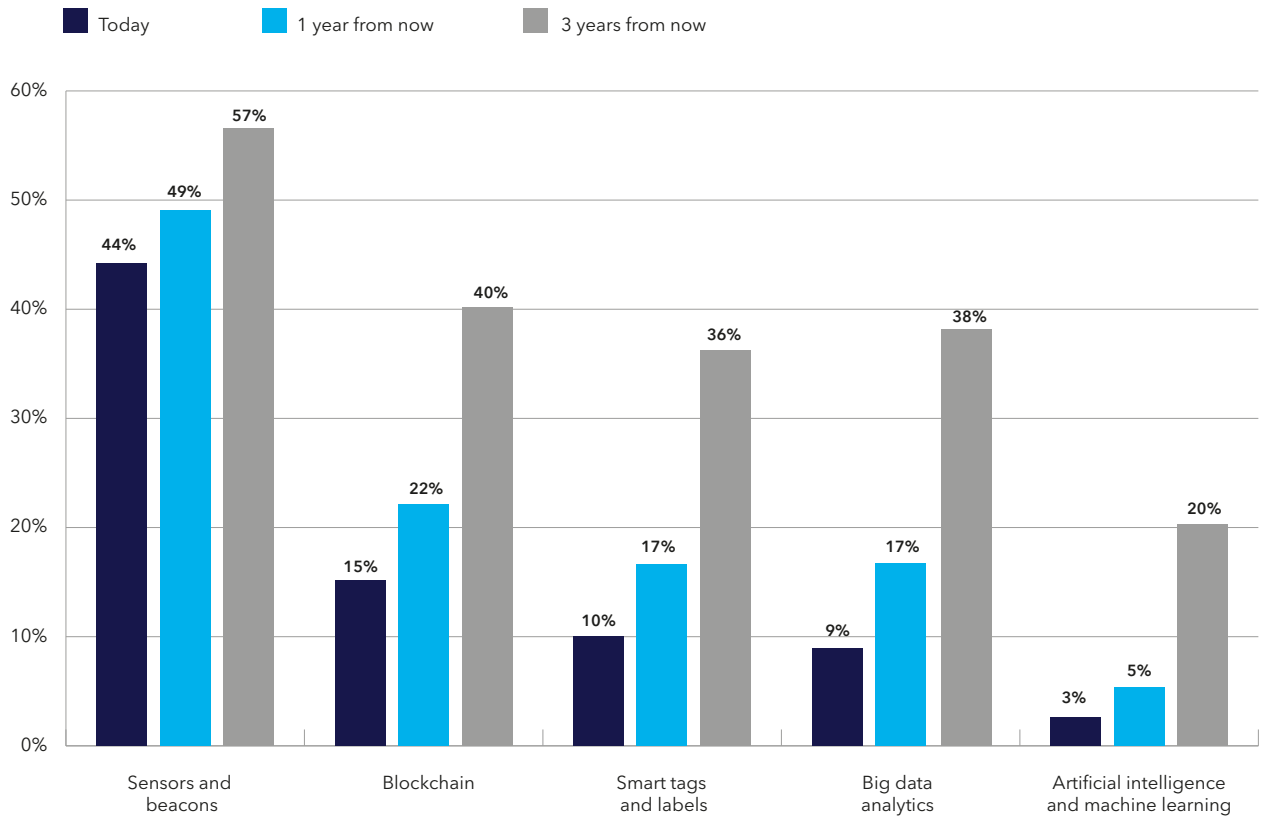
For sensors and beacons, feed manufacturers are the highest users with 57%. Food services, on the other hand, register the highest score for blockchain at 23% (see appendix page 44). This may be linked to food service industry's strong link to the B2C world where blockchain is opening up many avenues for linking companies to consumers.

In a year from now, nothing significant changes apart from big data replacing smart tags and labels in the top 3 ranking. Interestingly, Asia stands out for all new digital technologies, while Europe seems still to be more oriented toward sensors and beacons.

Three years from now, Asia will maintain its high rates. Sensors & beacons still top the ranking with 57% but more balanced with blockchain at 40% and big data at 38%. Regardless, a primary challenge for companies will continue to be how to collect data. Practically, many companies are still challenged with how to do this in a structured way.

Which of the following digital technologies is your company using (or will use) for supporting food safety?

**Figure 19:** Food safety & new digital technologies – summary



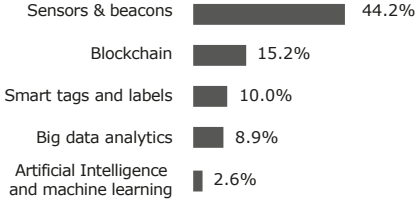

## EXPLORING FASTER

LEADERS indicate a higher application of nearly all new digital technologies both in 1 year and in 3 years' time.

Which of the following digital technologies is your company using (or will use) for supporting food safety?

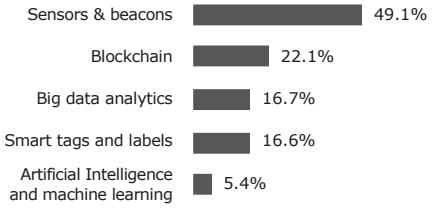
**Figure 20:** Food safety & new digital technologies

## Today



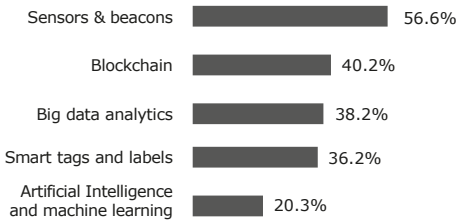

| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* | |
| Sensors & beacons | 44.2% | 50.7% | 36.4% | 37.8% | 48.1% | 46.1% | 54.4% |
| Blockchain | 15.2% | 18.8% | 11.1% | 0.0% | 22.9% | 16.0% | 22.8% |
| Smart tags and labels | 10.0% | 11.7% | 9.2% | 0.0% | 11.5% | 10.7% | 13.7% |
| Big data analytics | 8.9% | 8.5% | 8.3% | 13.5% | 13.0% | 9.4% | 16.2% |
| Artificial Intelligence and machine learning | 2.6% | 2.5% | 2.3% | 2.7% | 4.6% | 2.8% | 4.6% |

## 1 year from now




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* | |
| Sensors & beacons | 49.1% | 53.2% | 42.5% | 40.5% | 56.5% | 50.8% | 61.5% |
| Blockchain | 22.1% | 25.4% | 17.5% | 16.2% | 31.3% | 22.8% | 29.4% |
| Big data analytics | 16.7% | 15.4% | 15.8% | 32.4% | 25.2% | 17.1% | 24.9% |
| Smart tags and labels | 16.6% | 16.5% | 15.6% | 10.8% | 23.0% | 17.4% | 24.5% |
| Artificial Intelligence and machine learning | 5.4% | 4.6% | 5.1% | 8.1% | 10.7% | 5.3% | 8.3% |

## 3 years from now



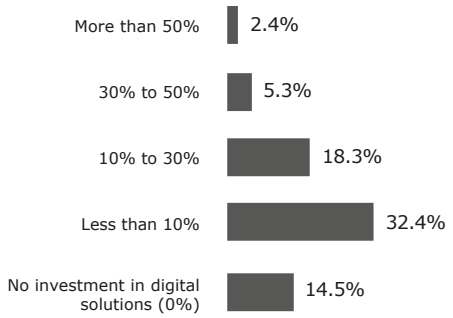

| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | *728* | *577* | *37* | *131* | *1,453* | *241* | |
| Sensors & beacons | 56.6% | 60.2% | 50.0% | 51.3% | 66.4% | 58.4% | 66.9% |
| Blockchain | 40.2% | 42.0% | 34.7% | 37.8% | 57.3% | 41.2% | 47.7% |
| Big data analytics | 38.2% | 35.7% | 36.4% | 64.8% | 52.7% | 39.1% | 50.6% |
| Smart tags and labels | 36.2% | 36.4% | 33.8% | 32.4% | 44.4% | 37.6% | 46.9% |
| Artificial Intelligence and machine learning | 20.3% | 18.7% | 19.0% | 24.3% | 30.5% | 20.6% | 27.0% |

Companies were also questioned about the investments they will make in digital solutions to address food safety. Answers to this question could reflect the perceived picture indicated already: food & beverage companies have a sense of the importance new digital technologies could play in their industry but are not sure about the practical application in food safety, yet.

This seems to support the notion that many companies are still exploring how new digital technologies can be used to enhance food safety more effectively and efficiently than today within their own operations and throughout the supply chains. A total of 27% do not know how much they will invest.

How much of your overall investment in food safety in the next 12 to 18 months will be addressed/allocated towards digital solutions aimed at enhancing food safety? Express this as a percentage of your company's overall investment in food safety.

**Figure 21:** Future investments in digital solutions




| | TOTAL n=1,643 | Europe | North America | Central & South America | Asia | GFSI | LEADERS |
|---|---|---|---|---|---|---|---|
| | | *728* | *577* | *37* | *131* | *1,453* | *241* |
| More than 50% | 2.4% | 1.6% | 3.1% | 5.4% | 3.1% | 2.5% | 4.1% |
| 30% to 50% | 5.3% | 4.5% | 5.7% | 10.8% | 4.6% | 5.7% | 8.7% |
| 10% to 30% | 18.3% | 18.8% | 19.1% | 5.4% | 20.6% | 18.5% | 19.9% |
| Less than 10% | 32.4% | 34.3% | 31.2% | 40.5% | 24.4% | 32.8% | 34.0% |
| No investment in digital solutions (0%) | 14.5% | 12.1% | 17.9% | 5.4% | 13.7% | 14.0% | 7.9% |
| DK/DA | 27.1% | 28.7% | 23.0% | 32.5% | 33.6% | 26.5% | 25.4% |

## MORE FOCUSED ON INVESTMENT

The share of LEADERS who will not invest in digital solutions is close to half that of the general sample, 8% versus 14%.

# Digitalization trends in food safety

**In the last decade, a series of scandals in the retail industry worldwide have undermined consumer trust. Whether it is in dairy, with the 2008 melamine scandal in China, the 2013 contamination of beef products with horse meat or last year's French/ Spanish fake rosé wine, customers are questioning their trust in producers and product retailers across the globe. These experiences have strengthened their needs to know about the characteristics and origin of the food they are buying and eating.**

Cloud-service technologies, sensors & beacons, IoT & connectivity, analytics based on Artificial Intelligence and Machine Learning, and Smart tags & labels are only some of the technologies that are making their way into many sectors in a disruptive fashion.

It is also worth mentioning that, after making a first appearance in FinTech, blockchain technology has grown to branch out into almost every other sector, including the food & beverage industry.

Blockchain, a new data storage technique, allows users to make a "chain" of relevant information on, effectively, anything. This "chain" cannot be changed once information has been stored – it is incorruptible. For this reason, blockchain is being touted as a revolutionary technology with far-reaching implications.

# HOW CAN NEW TECHNOLOGIES ASSIST IN ENSURING FOOD SAFETY?

**Some key trends on food safety include the drive towards transparency and an increasing awareness of food safety among the public. Higher levels of scrutiny are becoming mainstream and many retailers feel the pressure to better inform the general public. They are creating various initiatives along with food producers and their upstream supply chain.**

In addition, authorities in several countries appear to be strengthening their will to pilot new technologies in certain agricultural sectors in order to evaluate whether blockchain and tracking can actually make food recalls more effective while reducing costs at the same time.

How can the blockchain be used to bridge the gap in trust between consumer and producer? The trust gap is best bridged by the incorruptible blockchain data storage system, as well as being verified by an independent party.

Blockchain allows each products' tracking history to be traced "from farm to table" with timestamped information at every stage of their creation process. The unique way blockchain stores data means that the information cannot be tampered with nor falsified.

The producer and its suppliers jointly compile relevant information on the farming and food processing, right up until the product is packaged. This information, in data form, is collected by all parties in the supply chain. Various platforms are investigating and running trials and a few of them are also in production. Ingredients and materials used in the making of these products, among many other factors, are recorded and in some instances also verified. When the product reaches the end user, data regarding the product has been stored on the blockchain and shown to customers via a unique, secure QR code. The only thing the final consumer has to do is to see the entire timeline of their product by scanning the secure QR code with a smartphone.

There are varying degrees of data integrity and we will still probably witness cases in the future of data shortcuts where the data quality is insufficient or data has been logged in a plain wrong manner.

Digitalising production steps is a tremendous opportunity for both supply chain members, such as producers and retailers as well as government bodies as it allows gaining an overview of data which pertains to the full supply chain. Early warning systems can be employed and, in this instance, artificial intelligence can be well put to work to compute large quantities of data in order to identify implausible data sets.

Testing and certification results could be made more readily available on large and accessible databases, likely to be more decentralised ledger systems, where many participants can engage in networks and thereby harness the collective intelligence instead of just their own, limited remit. There will be challenges to be faced ahead but neutral and anonymous databases may be accessed by parties in order for intelligent conclusions to be drawn as best practice and also in case of a safety incident, communication and logistics tracking can be done faster. If sample testing and problematic areas are made available in certain networks at B2B and authority levels, intelligence can be drawn around hot spots where issues arise and the related parties can agree on added measures and conduct root cause analysis to remedy the issue.

Today, a recall consists of an alert issued by a retailer that is likely to reach no more than 10% of the public, unless we are talking about a severe incident affecting a large number of subjects that somehow made the news. In the future, we can imagine that retailers will be able to reach consumers at an individual level with a push notification because the latter bought the affected product through some mobile app.

## THE SHARED FUTURE

There are various producers and retail brands who offer some form of product transparency. Looking ahead, there will be information processes to help extract further information along the supply chain journey of individual products so that information and transparency will reach higher standards. Higher standards mean food safety is also benefiting. Brands will be able to communicate directly with end users and information will no longer only be one-way, from producer/brand to consumer, but become interactive, with reviews and ratings reaching the producers and their brands in a more direct manner.

Brands will promote their superior sustainable products through social media and loyalty programmes while logistics partners will want to demonstrate that their performance is above the benchmark. As to the retail side, along with the possibility for eCommerce to promote sustainability and product safety features, the transparency and trust in retail will continue to rise as consumers will expect more from brands.

## CHALLENGES AND OPPORTUNITIES

The question is: who will pay for the added vigilance and transparency intended to build trust? Stricter food safety standards set by regulation the authorities will demand new solutions to be implemented. At the moment, the German government together with local retailers has started a 4-stage-labelling of meat products, where the lowest level corresponds to minimum regulatory standards when it comes to animal welfare. The three levels above obviously cater to better conditions. The top level is level 4, "Premium", with the highest scoring points for transparency and animal care. In the short term, this level is likely to be managed via a "premium" feature on certain products. But the challenge is for digitalization to reap benefits so as to even become mainstream in all parts of the chain, as for any product. The limits are more likely to be pushed where the margins allow for it.

Recent research suggests that certain consumer groups, particularly millennials, are prepared to pay a premium for sustainable products that offer extra quality, safety, environmental and ethical benefits.

Currently, counterfeit products cause billions in losses every year for the retail industry. Erasing these losses alone would finance the costs of many technology introductions, including blockchain.

A question remains over how quickly technology can be rolled out across each level of the retail industry and which product categories will be most dynamic. But with the expansion already beginning, we have seen that for example blockchain could work. Each of the aforementioned technologies – cloud services, sensors & beacons, IoT, analytics based on Artificial Intelligence and Machine Learning and Smart tags & labels–will all make their inroads. This is accelerated by large players taking decisive steps and by newcomers, so-called challenger brands, which embrace innovation and are often set up to adopt technology with less legacy operations to be adjusted to, and can thus make technology leaps cheaper than more established players.

The above has merely covered food safety, so imagine the consumer engagement and the B2B efficiency gains which can be harvested. There is no turning back, the world will never turn as slowly as it does today. Competition and the strive for transparency will ensure that some form of digitalization will kick in, which means any company not considering or investing in digitalization will probably not be around in 10 years.

# OUR FINAL THOUGHTS

This survey underscores just how much the food & beverage industry is committed to protecting consumer health and complying with regulations. The responses indicate strong synergies between food safety, regulatory compliance and certification of food safety systems. This is a great testimony to the global work on harmonization of food safety standards (both private and public).

Food safety is relevant to the business strategy for 90% of the companies responding. Of those only 63% said to a great extent but with an expected 5 percentage point increase 3 years from now. This small increase underscores the need to keep a strong focus on food safety by all stakeholders in the food & beverage value chain remains high. While the industry is fully committed, respondents in the survey were careful about calling themselves leading in food safety. While the maturity rating increases in the next 3 years, this could reflect the complexity and ever-changing challenges of fully managing food safety throughout the value chain.

Food safety systems and certification are recognised and established tools for management and continual improvement, increasing maturity. The need to develop a food safety culture is identified as a rising opportunity while food safety management systems, HACCP and procedures remain the preferred means for the industry. In the survey, food safety culture is the fourth most effective measure, emphasizing the human element and indicating it as a means to take food safety even further.

Certification is mostly perceived as a ticket-to-trade. In an environment where supplier assessments are stricter than ever and pressure to manage food safety throughout the value chain is increasing, it is a tangible way to improve food safety programmes and supply chains. Results suggest that customer requirements are for 79% of the sample either the first, second or third most important driver behind getting certified.

Improved ability to comply with regulations (86%) is the highest rated benefit of certification, with improved food safety and quality coming in second. Employee awareness comes in third with 78%. Companies rate high a number of other benefits from certification, underscoring that it is an effective and efficient tool to ensure safer food for consumers. All other benefits but one (advantages with banks and insurance) were selected by more than 60% of respondents. These ranged from safer food to business reputation and market opportunities.

Certification requirements cascade across the supply chain and almost half of the sample (42%) requires most suppliers to be certified while over a quarter (29%) require they all are in order to provide more confidence in suppliers and products, improving food safety overall.

What comes next? In addition to the growing emphasis on food safety culture, new digital technologies are still to be explored and exploited. Only 9% indicate to a "great extent" that they think new digital technologies (such as big data analytics, IoT, sensors, Blockchain, smart tags) will enhance food safety in their company short term. However, the outlook is interesting. The figure almost doubles to 15% in only 1 year and jumps to 37% in 3 years, perhaps indicating that the industry intends to take advantage to further advance their commitment and work on food safety.

# THE LEADERS' APPROACH TO FOOD SAFETY

**01** LEADERS put consumer health at the top of everything

**02** Reputation is an important driver for LEADERS to focus on food safety

**03** LEADERS are advanced in food safety culture programmes

**04** LEADERS mitigate risks by enhancing their food safety systems, culture and supply chain management

**05** Food safety is relevant to the business strategy of LEADERS

**06** LEADERS will continue to invest in food safety

**07** LEADERS capture significant value from certification for driving their continuous business improvement

**08** LEADERS use certification to improve food safety programmes

**09** LEADERS put emphasis on supplier certification

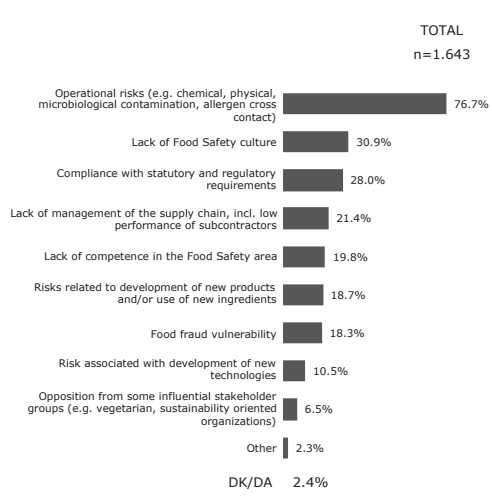
**10** While contribution of digital technologies is still not extensively understood, LEADERS look better positioned

# APPENDIX

There are many possible reasons to focus on Food Safety in an organization. Why is Food Safety important for your company?

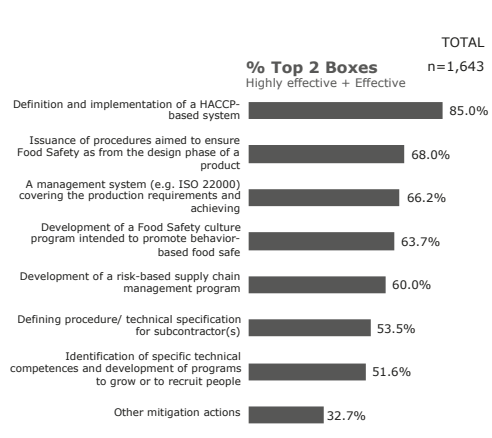

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | 245 | 1.115 | 43 | 166 | 56 | 182 | 140 | 59 | 727 | 269 |
| Safeguarding the health of consumers | 80.0% | 93.0% | 86.0% | 89.8% | 96.4% | 76.4% | 90.0% | 71.2% | 87.1% | 90.0% |
| Laws and regulations | 60.0% | 72.1% | 79.1% | 73.5% | 71.4% | 65.9% | 72.1% | 71.2% | 67.0% | 75.5% |
| Needs/requests from customers | 69.8% | 58.1% | 55.8% | 68.1% | 58.9% | 74.7% | 66.4% | 49.2% | 61.3% | 57.6% |
| Brand reputation | 47.3% | 59.6% | 69.8% | 52.4% | 69.6% | 50.5% | 54.3% | 39.0% | 50.1% | 62.8% |
| Proactive strategy for demonstrating commitment towards consumers | 42.0% | 42.1% | 55.8% | 39.8% | 46.4% | 44.0% | 45.0% | 35.6% | 36.5% | 46.1% |
| Competition or competitive advantage | 33.9% | 39.6% | 44.2% | 36.7% | 42.9% | 48.9% | 42.9% | 32.2% | 38.5% | 41.3% |
| Internal policy (e.g. through corporate requirements or requirements from owners) | 31.0% | 37.8% | 37.2% | 36.1% | 26.8% | 35.7% | 45.0% | 27.1% | 29.3% | 44.2% |
| Public concern | 36.7% | 35.8% | 41.9% | 37.3% | 35.7% | 31.9% | 33.6% | 27.1% | 31.5% | 38.3% |
| Business continuity | 26.5% | 36.7% | 51.2% | 34.3% | 35.7% | 32.4% | 39.3% | 27.1% | 30.0% | 38.7% |
| Economic (e.g. financial savings. loss prevention) | 28.2% | 37.6% | 44.2% | 36.7% | 35.7% | 22.5% | 40.7% | 20.3% | 30.4% | 36.4% |
| Safeguarding property/management | 17.1% | 21.4% | 18.6% | 18.1% | 19.6% | 16.5% | 26.4% | 15.3% | 18.3% | 22.3% |
| Insurance requirements (private/public) | 12.2% | 15.8% | 20.9% | 18.7% | 19.6% | 13.2% | 17.1% | 3.4% | 12.1% | 16.7% |
| Don't know | 0.8% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.4% | 0.0% |
| Other | 0.8% | 0.5% | 2.3% | 0.6% | 0.0% | 1.6% | 2.1% | 1.7% | 0.6% | 0.4% |

Please select the main risk areas in your company related to Food Safety



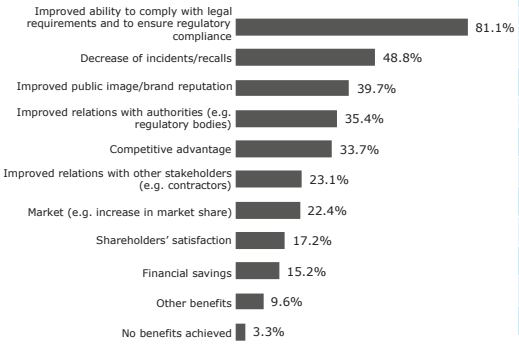

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | 245 | 1.115 | 43 | 166 | 56 | 182 | 140 | 59 | 727 | 269 |
| Operational risks (e.g. chemical, physical, microbiological contamination, allergen cross contact) | 74.7% | 81.5% | 83.7% | 76.5% | 85.7% | 65.9% | 75.0% | 52.5% | 75.4% | 81.0% |
| Lack of Food Safety culture | 23.3% | 33.8% | 34.9% | 28.9% | 32.1% | 33.0% | 35.0% | 22.0% | 26.3% | 34.6% |
| Compliance with statutory and regulatory requirements | 26.1% | 26.0% | 37.2% | 37.3% | 32.1% | 29.1% | 39.3% | 30.5% | 28.7% | 25.7% |
| Lack of management of the supply chain, incl. low performance of subcontractors | 11.8% | 22.8% | 30.2% | 29.5% | 21.4% | 20.3% | 27.9% | 22.0% | 16.6% | 28.6% |
| Lack of competence in the Food Safety area | 13.5% | 21.1% | 25.6% | 24.7% | 26.8% | 17.6% | 26.4% | 16.9% | 17.1% | 22.7% |
| Risks related to development of new products and/or use of new ingredients | 8.6% | 21.9% | 23.3% | 16.3% | 21.4% | 20.9% | 20.0% | 10.2% | 16.2% | 20.1% |
| Food fraud vulnerability | 8.2% | 21.3% | 18.6% | 19.9% | 14.3% | 10.4% | 24.3% | 10.2% | 17.6% | 17.1% |
| Risk associated with development of new technologies | 7.3% | 10.9% | 18.6% | 10.2% | 8.9% | 14.8% | 13.6% | 15.3% | 8.3% | 13.8% |
| Opposition from some influential stakeholder groups (e.g. vegetarian, sustainability oriented organizations) | 6.1% | 7.0% | 9.3% | 9.0% | 12.5% | 5.5% | 10.7% | 10.2% | 5.0% | 10.4% |
| Other | 2.9% | 1.8% | 2.3% | 3.0% | 0.0% | 1.6% | 4.3% | 8.5% | 3.2% | 1.5% |
| DK/DA | 7.8% | 1.1% | 2.3% | 3.6% | 0.0% | 2.7% | 0.0% | 1.7% | 4.3% | 0.7% |

Please select the planned or undertaken actions so far to evaluate or mitigate the above identified risks, and rate the actions based on the evaluation scale below.




| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | 245 | 1115 | 43 | 166 | 56 | 182 | 140 | 59 | 727 | 269 |
| Definition and implementation of a HACCP-based system | 68.5% | 89.4% | 86.0% | 86.1% | 96.5% | 86.3% | 87.2% | 83.1% | 80.9% | 88.9% |
| Issuance of procedures aimed to ensure Food Safety as from the design phase of a product | 64.1% | 71.2% | 72.1% | 66.3% | 69.6% | 69.8% | 62.1% | 62.7% | 64.9% | 66.2% |
| A management system (e.g. ISO 22000) covering the production requirements and achieving | 48.6% | 70.1% | 69.7% | 62.6% | 73.2% | 73.1% | 63.6% | 57.6% | 61.2% | 69.1% |
| Development of a Food Safety culture program intended to promote behavior-based food safe | 61.2% | 65.7% | 69.7% | 62.7% | 82.1% | 59.9% | 58.6% | 62.7% | 64.4% | 62.4% |
| Development of a risk-based supply chain management program | 52.6% | 62.0% | 83.7% | 65.7% | 75.0% | 62.7% | 62.9% | 62.7% | 57.0% | 64.6% |
| Defining procedure/ technical specification for subcontractor(s) | 48.2% | 54.0% | 62.8% | 60.9% | 58.9% | 55.5% | 60.0% | 59.3% | 51.5% | 57.6% |
| Identification of specific technical competences and development of programs to grow or to recruit people | 45.7% | 53.4% | 69.7% | 48.2% | 66.1% | 51.1% | 53.6% | 57.6% | 48.8% | 55.4% |
| Other mitigation actions | 31.0% | 33.9% | 55.8% | 43.3% | 39.3% | 33.5% | 42.1% | 42.4% | 29.1% | 35.7% |

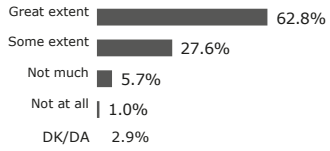
## What benefits did your company achieve from the risk mitigation actions undertaken?




| Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|
| *245* | *1115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| 74.7% | 85.3% | 93.0% | 81.3% | 83.9% | 77.5% | 82.1% | 72.9% | 78.4% | 83.6% |
| 38.4% | 53.4% | 60.5% | 56.0% | 48.2% | 40.1% | 50.7% | 40.7% | 45.0% | 52.0% |
| 37.1% | 40.0% | 44.2% | 38.6% | 41.1% | 41.8% | 46.4% | 40.7% | 38.1% | 39.4% |
| 36.7% | 38.7% | 44.2% | 37.3% | 48.2% | 18.7% | 38.6% | 33.9% | 32.7% | 40.9% |
| 34.7% | 33.0% | 23.3% | 26.5% | 44.6% | 44.0% | 36.4% | 39.0% | 31.9% | 31.6% |
| 22.4% | 23.5% | 25.6% | 30.7% | 26.8% | 18.7% | 35.0% | 23.7% | 20.8% | 26.0% |
| 26.9% | 22.7% | 27.9% | 25.9% | 33.9% | 26.4% | 25.0% | 13.6% | 23.2% | 17.5% |
| 16.3% | 18.7% | 23.3% | 15.7% | 23.2% | 15.4% | 22.1% | 20.3% | 15.3% | 19.0% |
| 13.9% | 17.3% | 32.6% | 18.1% | 23.2% | 8.2% | 20.0% | 6.8% | 13.5% | 19.0% |
| 9.4% | 10.1% | 14.0% | 10.8% | 12.5% | 11.0% | 18.6% | 18.6% | 7.3% | 13.8% |
| 6.5% | 2.6% | 4.7% | 3.0% | 3.6% | 2.2% | 5.7% | 3.4% | 5.0% | 2.2% |

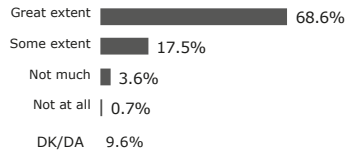
## To what extent are Food Safety issues relevant to your company's overall business strategy?

### TODAY




| Food primary | Food production | Food service | Food retail/ Wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|
| *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| 62.0% | 66.1% | 79.1% | 61.4% | 67.9% | 60.4% | 61.4% | 59.3% | 61.2% | 63.6% |
| 27.3% | 25.9% | 16.3% | 30.1% | 23.2% | 30.2% | 32.1% | 22.0% | 28.5% | 29.0% |
| 5.7% | 4.9% | 4.7% | 6.6% | 5.4% | 7.1% | 2.9% | 11.9% | 6.6% | 4.8% |
| 2.9% | 0.7% | 0.0% | 0.0% | 1.8% | 0.5% | 1.4% | 0.0% | 1.4% | 0.4% |
| 2.1% | 2.4% | 0.0% | 1.9% | 1.7% | 1.8% | 2.2% | 6.8% | 2.3% | 2.2% |

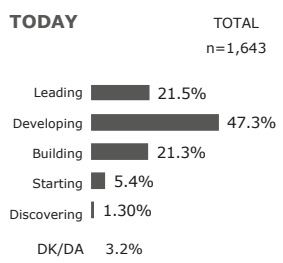
### 3 YEARS FROM NOW




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 60.8% | 72.2% | 79.1% | 72.3% | 67.9% | 66.5% | 70.0% | 72.9% | 65.7% | 73.2% |
| 18.4% | 15.9% | 16.3% | 17.5% | 10.7% | 22.5% | 16.4% | 13.6% | 18.8% | 16.7% |
| 4.1% | 2.7% | 0.0% | 3.0% | 7.1% | 3.3% | 4.3% | 5.1% | 4.7% | 3.3% |
| 2.4% | 0.6% | 0.0% | 0.0% | 1.8% | 1.1% | 0.0% | 0.0% | 0.8% | 0.4% |
| 14.3% | 8.6% | 4.6% | 7.2% | 12.5% | 6.6% | 9.3% | 8.4% | 10.0% | 6.4% |

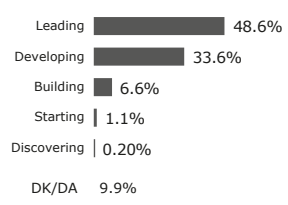
## From a Food Safety management maturity point of view, where would you position your company on a 5-point development scale?

### TODAY



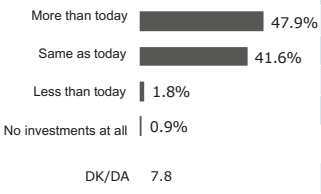

| Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|
| *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| 26.1% | 21.7% | 27.9% | 18.7% | 23.2% | 19.2% | 21.4% | 18.6% | 18.8% | 26.8% |
| 46.9% | 48.0% | 39.5% | 48.2% | 50.0% | 50.0% | 50.0% | 45.8% | 47.9% | 46.5% |
| 19.6% | 21.0% | 16.3% | 23.5% | 17.9% | 21.4% | 20.7% | 23.7% | 23.8% | 15.2% |
| 4.9% | 5.1% | 11.6% | 6.0% | 3.6% | 7.1% | 5.0% | 3.4% | 6.1% | 7.4% |
| 0.0% | 1.4% | 2.3% | 1.2% | 1.8% | 1.1% | 1.4% | 5.1% | 1.2% | 1.5% |
| 2.5% | 2.8% | 2.4% | 2.4% | 3.5% | 1.2% | 1.5% | 3.4% | 2.2% | 2.6% |

### 3 YEARS FROM NOW



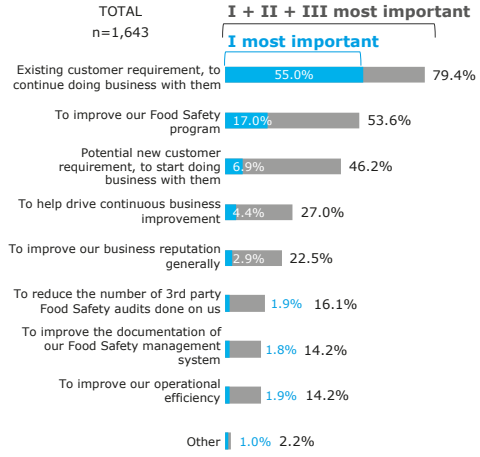

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 46.9% | 51.1% | 62.8% | 45.8% | 50.0% | 51.6% | 52.9% | 50.8% | 43.6% | 56.5% |
| 30.2% | 33.7% | 23.3% | 35.5% | 25.0% | 32.4% | 30.0% | 33.9% | 35.6% | 33.5% |
| 7.3% | 5.7% | 9.3% | 7.8% | 5.4% | 7.7% | 5.0% | 3.4% | 8.5% | 4.8% |
| 0.4% | 1.2% | 0.0% | 0.0% | 1.8% | 0.5% | 0.0% | 5.1% | 1.5% | 0.7% |
| 0.0% | 0.1% | 0.0% | 0.0% | 0.0% | 1.1% | 0.7% | 1.7% | 0.1% | 0.7% |
| 15.2% | 8.2% | 4.6% | 10.9% | 17.8% | 6.7% | 11.4% | 5.1% | 10.7% | 3.8% |

## Is your company going to invest in Food Safety in the next 3 years?



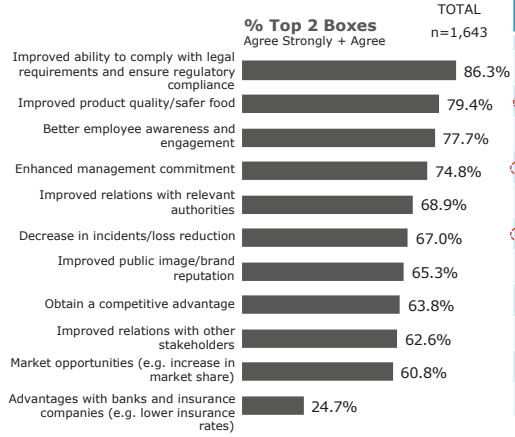

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| More than today | 44.5% | 50.4% | 62.8% | 47.0% | 60.7% | 47.3% | 48.6% | 57.6% | 45.8% | 50.2% |
| Same as today | 42.9% | 40.1% | 27.9% | 44.6% | 28.6% | 47.3% | 37.9% | 32.2% | 43.5% | 40.1% |
| Less than today | 2.4% | 2.1% | 2.3% | 0.0% | 0.0% | 0.0% | 2.9% | 0.0% | 2.1% | 1.5% |
| No investments at all | 2.0% | 0.5% | 0.0% | 1.2% | 1.8% | 0.5% | 0.0% | 0.0% | 1.1% | 1.1% |
| DK/DA | 8.2% | 6.9% | 7.0% | 7.2% | 8.9% | 4.9% | 10.6% | 10.2% | 7.5% | 7.1% |

## Please rank the first three factors which led to the certification of your Food Safety system (or management system).



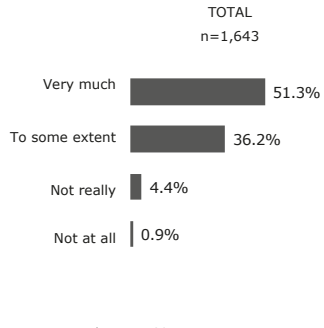

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | 245 | 1115 | 43 | 166 | *56* | *182* | *140* | *59* | 727 | 269 |
| Existing customer requirement, to continue doing business with them | 86.6% | 80.3% | 65.1% | 75.9% | 69.7% | 86.2% | 72.9% | 66.2% | 79.0% | 75.5% |
| To improve our Food Safety program | 52.7% | 58.4% | 65.1% | 51.2% | 57.2% | 39.5% | 55.0% | 32.3% | 52.2% | 58.0% |
| Potential new customer requirement, to start doing business with them | 48.2% | 46.5% | 39.5% | 42.2% | 50.0% | 57.7% | 46.4% | 40.7% | 50.0% | 37.1% |
| To help drive continuous business improvement | 27.8% | 27.2% | 21.0% | 26.5% | 17.8% | 26.3% | 29.3% | 28.9% | 26.8% | 29.4% |
| To improve our business reputation generally | 23.2% | 22.2% | 20.9% | 23.4% | 25.0% | 22.5% | 19.3% | 18.7% | 23.6% | 22.3% |
| To reduce the number of 3rd party Food Safety audits done on us | 13.0% | 17.6% | 11.7% | 8.4% | 16.1% | 20.8% | 13.6% | 17.0% | 11.6% | 21.2% |
| To improve the documentation of our Food Safety management system | 10.6% | 15.1% | 25.7% | 19.2% | 7.2% | 14.2% | 12.9% | 11.9% | 14.7% | 15.0% |
| To improve our operational efficiency | 15.5% | 13.3% | 16.3% | 19.2% | 17.8% | 10.9% | 15.7% | 17.0% | 15.2% | 14.1% |
| Other | 3.3% | 1.6% | 4.6% | 4.2% | 3.6% | 2.7% | 2.8% | 1.7% | 2.3% | 3.3% |

## A company may gain different benefits from certification of their Food Safety system. For your company, how much do you agree with the benefits listed below?



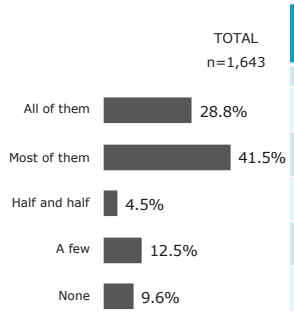

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Improved ability to comply with legal requirements and ensure regulatory compliance | 84.5% | 89.3% | 88.4% | 88.0% | 85.7% | 88.5% | 87.8% | 71.2% | 86.3% | 84.1% |
| Improved product quality/safer food | 73.5% | 83.9% | 76.8% | 72.9% | 76.8% | 85.7% | 73.6% | 71.2% | 75.8% | 79.6% |
| Better employee awareness and engagement | 74.3% | 79.5% | 79.1% | 72.9% | 78.6% | 86.2% | 77.8% | 69.5% | 74.7% | 77.4% |
| Enhanced management commitment | 69.4% | 78.6% | 81.4% | 69.9% | 67.9% | 78.1% | 77.8% | 61.0% | 69.9% | 77.7% |
| Improved relations with relevant authorities | 71.4% | 72.7% | 67.4% | 65.1% | 67.9% | 64.2% | 67.2% | 52.5% | 65.6% | 68.4% |
| Decrease in incidents/loss reduction | 52.6% | 72.3% | 65.1% | 63.3% | 58.9% | 69.8% | 69.3% | 55.9% | 61.7% | 67.6% |
| Improved public image/brand reputation | 62.4% | 68.4% | 65.1% | 57.8% | 50.0% | 72.6% | 68.6% | 52.5% | 66.0% | 58.7% |
| Obtain a competitive advantage | 60.0% | 65.9% | 58.1% | 56.0% | 60.7% | 75.8% | 64.3% | 61.0% | 63.0% | 57.6% |
| Improved relations with other stakeholders | 59.2% | 66.2% | 65.1% | 57.9% | 64.2% | 65.4% | 60.0% | 47.5% | 58.2% | 64.7% |
| Market opportunities (e.g. increase in market share) | 59.6% | 63.0% | 51.2% | 55.4% | 58.9% | 72.0% | 61.5% | 55.9% | 61.5% | 53.2% |
| Advantages with banks and insurance companies (e.g. lower insurance rates) | 24.4% | 27.4% | 32.5% | 16.2% | 26.8% | 24.7% | 30.0% | 22.1% | 21.4% | 23.8% |

To what extent does certification of your Food Safety system add value to your organization and your stakeholders?



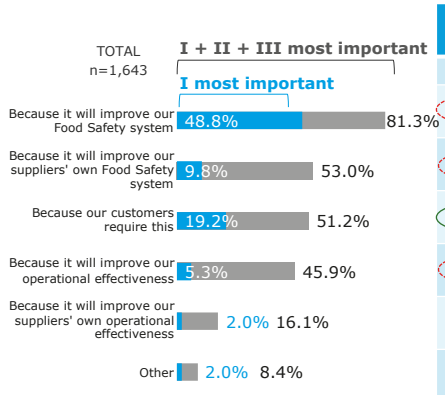

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Very much | 50.2% | 53.7% | 48.8% | 42.8% | 51.8% | 61.5% | 55.7% | 44.1% | 48.1% | 46.1% |
| To some extent | 33.5% | 37.7% | 39.5% | 42.2% | 28.6% | 30.8% | 32.1% | 23.7% | 36.5% | 42.4% |
| Not really | 9.4% | 3.0% | 0.0% | 4.2% | 1.8% | 2.7% | 3.6% | 13.6% | 6.6% | 3.7% |
| Not at all | 4.1% | 0.2% | 0.0% | 0.6% | 1.8% | 0.0% | 0.7% | 0.0% | 1.5% | 0.4% |
| DK/DA | 2.8% | 5.4% | 11.7% | 10.2% | 16.0% | 5.0% | 7.9% | 18.6% | 7.3% | 7.4% |

Do you require your suppliers to be certified?



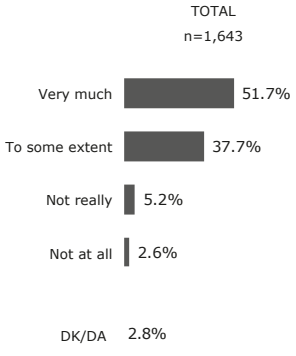

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| All of them | 31.0% | 30.9% | 41.9% | 38.6% | 19.6% | 14.8% | 31.4% | 15.3% | 28.5% | 33.5% |
| Most of them | 30.2% | 45.2% | 48.8% | 38.6% | 48.2% | 42.3% | 40.7% | 28.8% | 40.7% | 39.8% |
| Half and half | 3.7% | 4.6% | 0.0% | 4.8% | 3.6% | 4.9% | 3.6% | 1.7% | 4.0% | 3.7% |
| A few | 15.1% | 11.4% | 4.7% | 7.8% | 16.1% | 18.7% | 10.0% | 20.3% | 14.3% | 9.3% |
| None | 13.1% | 6.6% | 4.7% | 9.0% | 12.5% | 17.0% | 9.3% | 27.1% | 9.8% | 11.2% |
| DK/DA | 6.9% | 1.3% | 0.0% | 1.2% | 0.0% | 2.3% | 5.0% | 6.8% | 2.7% | 2.5% |

Please rank the first three drivers / factors for your company requiring suppliers to be certified.




| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Because it will improve our Food Safety system | 73.9% | 87.0% | 93.0% | 81.3% | 85.7% | 74.2% | 80.0% | 59.3% | 80.1% | 82.5% |
| Because it will improve our suppliers' own Food Safety system | 43.6% | 56.8% | 53.6% | 55.4% | 60.7% | 45.5% | 50.7% | 44.1% | 50.7% | 61.4% |
| Because our customers require this | 58.8% | 51.2% | 46.6% | 59.7% | 55.4% | 49.4% | 57.2% | 39.0% | 50.4% | 46.5% |
| Because it will improve our operational effectiveness | 39.2% | 50.0% | 53.5% | 49.4% | 44.6% | 41.2% | 45.7% | 32.2% | 46.5% | 43.0% |
| Because it will improve our suppliers' own operational effectiveness | 14.3% | 16.2% | 18.6% | 12.0% | 10.7% | 18.6% | 12.1% | 18.7% | 17.5% | 13.4% |
| Other | 9.7% | 7.7% | 9.3% | 4.8% | 3.6% | 8.2% | 11.4% | 17.0% | 8.7% | 10.4% |

To what extent is supplier certification beneficial to your company?



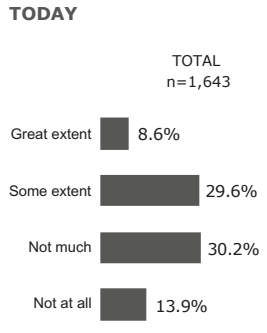

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Very much | 40.4% | 56.5% | 69.8% | 64.5% | 57.1% | 47.3% | 61.4% | 30.5% | 49.8% | 55.4% |
| To some extent | 38.4% | 37.7% | 25.6% | 28.3% | 33.9% | 42.3% | 25.0% | 42.4% | 37.4% | 34.9% |
| Not really | 8.2% | 3.2% | 2.3% | 3.6% | 5.4% | 7.1% | 5.7% | 15.3% | 6.3% | 6.3% |
| Not at all | 8.6% | 1.2% | 0.0% | 1.2% | 0.0% | 1.6% | 5.7% | 6.8% | 4.5% | 1.1% |
| DK/DA | 4.4% | 1.4% | 2.3% | 2.4% | 3.6% | 1.7% | 2.2% | 5.0% | 2.0% | 2.3% |

What are the main benefits for your company from supplier certification?


| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| More confidence in the supplier / products | 58.4% | 76.4% | 76.7% | 79.5% | 82.1% | 72.0% | 72.9% | 59.3% | 70.6% | 73.2% |
| Safer products | 58.4% | 70.1% | 83.7% | 73.5% | 66.1% | 68.7% | 72.1% | 49.2% | 65.5% | 69.5% |
| Compliance to specifications / meet our requirements | 60.8% | 67.7% | 62.8% | 66.9% | 67.9% | 67.6% | 68.6% | 57.6% | 63.1% | 66.2% |
| Supplier approval process / verification of suppliers / vendors | 36.7% | 59.2% | 60.5% | 51.8% | 66.1% | 56.0% | 59.3% | 40.7% | 48.6% | 58.7% |
| Certified to a recognized standard | 37.6% | 46.8% | 46.5% | 51.8% | 53.6% | 48.9% | 55.0% | 40.7% | 44.0% | 49.8% |
| Good documentation | 35.5% | 44.7% | 55.8% | 48.2% | 50.0% | 44.5% | 53.6% | 35.6% | 42.9% | 43.9% |
| Reduces audit time / cost / fewer audits | 30.6% | 46.2% | 46.5% | 39.8% | 53.6% | 51.1% | 43.6% | 28.8% | 36.3% | 49.8% |
| Better quality | 32.2% | 44.4% | 51.2% | 42.2% | 37.5% | 43.4% | 52.9% | 35.6% | 39.9% | 45.0% |
| Fewer issues with suppliers / products | 33.9% | 44.8% | 48.8% | 43.4% | 41.1% | 40.7% | 45.0% | 33.9% | 37.8% | 44.6% |
| Other | 0.0% | 0.9% | 0.0% | 0.0% | 1.8% | 1.1% | 1.4% | 8.5% | 0.8% | 0.4% |
| DK/DA | 4.9% | 0.5% | 0.0% | 0.6% | 0.0% | 3.8% | 1.4% | 1.7% | 1.9% | 2.6% |

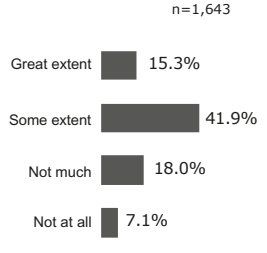
To what extent do you think that new digital technologies (e.g. big data analytics, IOT, sensors, blockchain, smart tags) contributes or will contribute to enhance Food Safety in your company?

**TODAY**



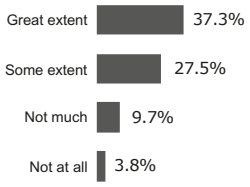

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Great extent | 11.0% | 8.3% | 20.9% | 7.2% | 14.3% | 7.1% | 10.7% | 11.9% | 7.6% | 8.2% |
| Some extent | 26.9% | 30.1% | 44.2% | 28.9% | 26.8% | 33.0% | 42.1% | 32.2% | 27.2% | 31.6% |
| Not much | 26.5% | 31.7% | 20.9% | 34.3% | 28.6% | 29.1% | 23.6% | 18.6% | 30.5% | 31.6% |
| Not at all | 18.0% | 13.5% | 4.7% | 12.0% | 8.9% | 14.8% | 12.9% | 20.3% | 15.4% | 12.3% |

**1 YEAR**




| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Great extent | 16.3% | 15.0% | 30.2% | 15.1% | 14.3% | 14.3% | 22.1% | 25.4% | 13.2% | 19.0% |
| Some extent | 35.5% | 44.2% | 51.2% | 41.6% | 51.8% | 42.3% | 45.7% | 37.3% | 39.1% | 42.8% |
| Not much | 17.6% | 18.2% | 11.6% | 21.7% | 8.9% | 18.7% | 16.4% | 11.9% | 19.1% | 20.1% |
| Not at all | 10.2% | 6.0% | 2.3% | 4.2% | 3.6% | 11.0% | 4.3% | 15.3% | 8.7% | 5.2% |

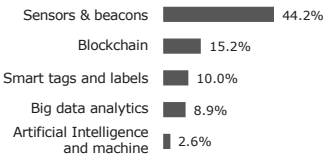
### 3 YEARS




| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Great extent | 31.4% | 39.2% | 62.8% | 33.7% | 39.3% | 36.8% | 52.9% | 44.1% | 31.8% | 41.6% |
| Some extent | 23.7% | 29.2% | 23.3% | 30.1% | 25.0% | 28.0% | 23.6% | 22.0% | 26.3% | 33.1% |
| Not much | 14.3% | 8.5% | 0.0% | 12.0% | 7.1% | 11.5% | 5.7% | 10.2% | 11.3% | 7.4% |
| Not at all | 7.3% | 2.7% | 2.3% | 1.2% | 1.8% | 4.9% | 1.4% | 10.2% | 5.5% | 1.9% |

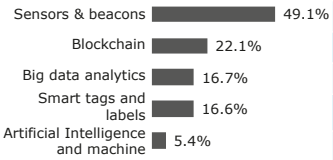
Which of the following digital technologies is your company using (or will use) for supporting Food Safety?

### TODAY



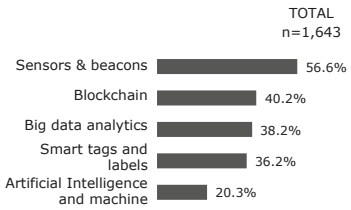

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Sensors & beacons | 42.0% | 49.1% | 55.8% | 41.0% | 57.1% | 42.3% | 50.7% | 33.9% | 39.8% | 54.6% |
| Blockchain | 18.0% | 14.8% | 23.3% | 18.1% | 16.1% | 19.2% | 17.1% | 13.6% | 14.2% | 16.4% |
| Smart tags and labels | 15.1% | 9.1% | 16.3% | 15.1% | 16.1% | 17.6% | 16.4% | 6.8% | 8.5% | 13.8% |
| Big data analytics | 8.6% | 9.0% | 16.3% | 8.4% | 8.9% | 13.7% | 10.0% | 8.5% | 5.4% | 14.5% |
| Artificial Intelligence and machine | 3.7% | 2.5% | 2.3% | 3.6% | 5.4% | 4.9% | 2.1% | 3.4% | 2.1% | 3.7% |

### 1 YEAR FROM NOW



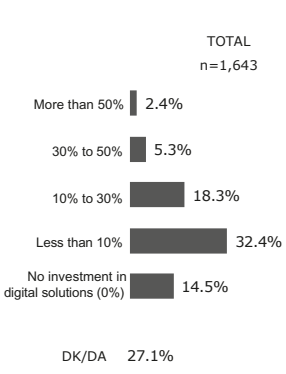

| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| Sensors & beacons | 45.3% | 54.1% | 58.1% | 47.6% | 57.1% | 45.6% | 57.1% | 40.7% | 44.1% | 58.7% |
| Blockchain | 25.8% | 22.0% | 28.0% | 23.5% | 26.8% | 29.1% | 23.5% | 20.4% | 20.0% | 26.1% |
| Big data analytics | 16.8% | 17.8% | 27.9% | 17.4% | 16.0% | 23.0% | 17.9% | 13.6% | 10.4% | 28.3% |
| Smart tags and labels | 20.8% | 16.2% | 27.9% | 22.9% | 21.5% | 23.1% | 25.7% | 11.9% | 15.0% | 23.1% |
| Artificial Intelligence and machine | 6.6% | 4.8% | 4.6% | 6.6% | 5.4% | 12.6% | 5.0% | 6.8% | 4.2% | 10.8% |

### 3 YEARS FROM NOW




| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| Sensors & beacons | 52.6% | 62.1% | 60.4% | 53.0% | 67.8% | 52.2% | 64.2% | 49.2% | 51.4% | 67.3% |
| Blockchain | 38.0% | 41.3% | 48.9% | 44.6% | 51.8% | 46.1% | 45.6% | 37.3% | 35.8% | 49.9% |
| Big data analytics | 34.4% | 40.8% | 62.8% | 34.3% | 46.4% | 43.3% | 40.0% | 39.0% | 29.8% | 54.7% |
| Smart tags and labels | 39.2% | 37.6% | 48.8% | 42.2% | 46.5% | 40.1% | 42.8% | 27.2% | 33.4% | 44.7% |
| Artificial Intelligence and machine | 21.3% | 20.0% | 34.8% | 18.6% | 23.3% | 27.4% | 20.7% | 27.1% | 16.9% | 32.0% |

How much of your overall investment in Food Safety in the next 12 to 18 months will be addressed/allocated towards digital solutions aimed at enhancing Food Safety? Express this as a percentage of your company's overall investment in Food Safety.




| | Food primary | Food production | Food service | Food retail/ wholesale | Feed manufacturing | Packaging manufacturing | Storage & distribution | Other | Small Company | Large Company |
|---|---|---|---|---|---|---|---|---|---|---|
| | *245* | *1,115* | *43* | *166* | *56* | *182* | *140* | *59* | *727* | *269* |
| More than 50% | 2.9% | 2.7% | 7.0% | 1.8% | 0.0% | 2.2% | 3.6% | 3.4% | 2.2% | 1.1% |
| 30% to 50% | 8.6% | 6.1% | 4.7% | 4.8% | 5.4% | 4.4% | 3.6% | 3.4% | 4.5% | 6.3% |
| 10% to 30% | 11.8% | 20.0% | 18.6% | 18.1% | 14.3% | 13.2% | 21.4% | 22.0% | 18.7% | 16.4% |
| Less than 10% | 29.4% | 33.1% | 37.2% | 39.2% | 37.5% | 34.6% | 37.1% | 25.4% | 33.1% | 34.9% |
| No investment in digital solutions (0%) | 23.3% | 11.8% | 7.0% | 7.8% | 7.1% | 14.8% | 8.6% | 27.1% | 19.3% | 10.0% |
| DK/DA | 24.0% | 26.3% | 25.5% | 28.3% | 35.7% | 30.8% | 25.7% | 18.7% | 22.2% | 31.3% |

# CREDITS

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# NOTES

VIEWPOINT REPORT
FEBRUARY 2019

**DNV GL**
DNV GL is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. With origins stretching back to 1864 and operations in more than 100 countries, our experts are dedicated to helping customers make the world safer, smarter and greener.

As one of the world's leading certification bodies, we help businesses assure the performance of their organizations, products, people, facilities and supply chains through certification, verification, assessment and training services. We combine technical, digital and industry expertise to empower companies' decisions and actions.. Partnering with our customers, we build sustainable business performance and create stakeholder trust across all types of industries. **dnvgl.com/viewpoint**

**GFSI**
The Global food safety Initiative (GFSI) brings together key actors of the food industry to collaboratively drive continuous improvement in food safety management systems around the world. With a vision of Safe food for consumers everywhere, food industry leaders created GFSI in 2000 to find collaborative solutions to collective concerns, notably to reduce food safety risks, audit duplication and costs while building trust throughout the supply chain. The GFSI community works on a volunteer basis and is composed of the world's leading food safety experts from retail, manufacturing and food service companies, as well as international organizations, governments, academia and service providers to the global food industry.

GFSI is powered by The Consumer Goods Forum (CGF), a global industry network working to support Better Lives Through Better Business. **www.mygfsi.com**