



The ISO 22000 series

Global standards for safe food supply chains

by Jacob Færgemand *The launching on 1 September 2005 of the ISO 22000 series, developed by ISO technical committee ISO/TC 34, Food products, signalled the arrival of a truly global option for ensuring safe food supply chains. This article gives a technical overview of the different standards in the series and how they can be put to use.*



The safety of feed and food at any point in the chain from producer to consumer is of worldwide concern. Food safety hazards may be introduced at any stage, therefore adequate control throughout the production chain is essential.

Examples of outbreaks of highly contagious diseases in livestock, such as foot and mouth disease, and of micro-organ-

isms like *salmonella* and *listeria* have highlighted the risks of food contamination.

Unsafe food is a risk for all – consumers can become seriously ill, and the industry can face costly corrective actions. The underlying belief that harmonization is possible across today's global industry is not enough, nor are sound food safety directives on their own.

Communication and raising awareness of potential hazards throughout the entire food chain – and therefore not restricted to one's company or department – is crucial. Food safety is a joint responsibility for all of the participating parties.

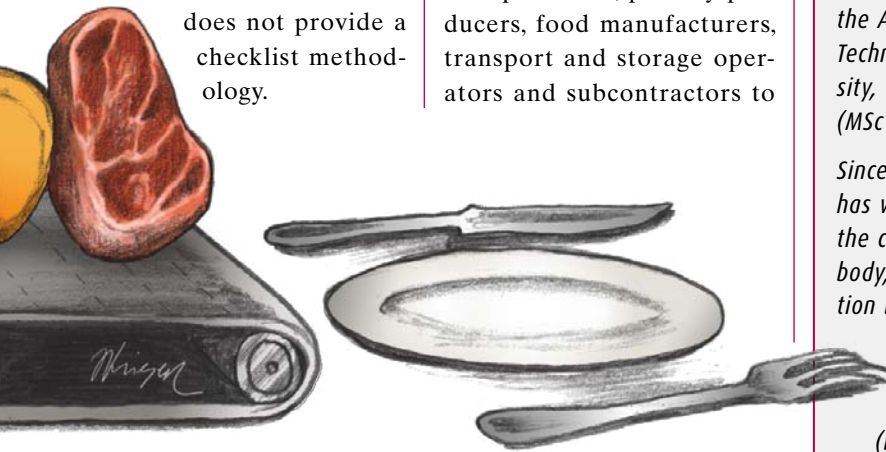
ISO 22000:2005, *Food safety management systems – Requirements for any organization in*



the food chain, aims to ensure that there are no weak links in the food supply chain. Since its publication in September 2005, the standard has been well received by the food industry and is clearly becoming a global standard to be reckoned with.

Tailor-made approach

ISO 22000 has been designed with flexibility to enable a tailor-made approach to food safety for all segments of the food chain. It does not take a "one size fits all approach", since the standards and procedures required for high risk areas in one food sector may not be appropriate in another. For this reason, unlike other schemes, the standard does not provide a checklist methodology.



If a company seeks certification to ISO 22000, it needs to follow local and export market laws, as well as implementing customer's requests. ISO 22000 requires that industry targets each specific type of food product adequately according to its needs.

Effectiveness through communication

Through the development of one system that crosses all food sector branches and national borders, food safety is strengthened by the harmonization of working procedures. This is one of the fundamental rationales behind the ISO 22000 standard.

If everyone uses the same methods and language, the system's effectiveness improves, increasing food safety, reducing the risk of critical errors and misunderstandings, and maximizing the use of resources.

ISO 22000 can be applied to all types of organization within the food chain, ranging from feed producers, primary producers, food manufacturers, transport and storage operators and subcontractors to

retail and food service outlets – together with inter-related organizations such as producers of equipment, packaging material, cleaning agents, additives and ingredients.

Making it safe to eat

ISO 22000 combines generally recognized key elements to ensure food safety along the food chain.

• Interactive communication

Clear communication along the food chain is essential to ensure that all relevant food safety hazards are identified and adequately controlled at each step. This implies communication of an organization's needs to the other organizations both upstream and downstream in the food chain. Communication with customers and suppliers, based on the information generated through sys-

tematic hazard analysis, will also assist in meeting customer and supplier's requirements in terms of feasibility, need and impact on the end product.

• System management

The most effective food safety systems are designed, operated and updated within the framework of a structured management system and incorporated into the overall management activities of the organization.

About the author

Dr. Jacob Færgemand, a food engineer, graduated from the Aalborg Technical University, Denmark (MSc and Phd).

Since 1994, he has worked with the certification

body, Bureau Veritas Certification Denmark, as lead auditor for ISO 9000 and HACCP, and as hygiene inspector for the BRC (British Retail Consortium).

In 1996, he became Food Sector Manager, and in 2002 Sales Director. He now has a position as Business Development Director Food for the Benelux and Nordic Region.

Dr. Færgemand is responsible for the Bureau Veritas



Certification activities worldwide on BRC inspection and ISO 22000 certification.

In 2001, he launched the development of ISO 22000 within the

ISO system.

Dr. Færgemand chairs the Danish food safety standardization group S-378, and is the convener of ISO/TC 34, Food products, working groups WG 8 and WG 11 on food safety management systems and related conformity assessment issues.

He holds a seat on the food committee of Global Food Safety Initiative (GFSI).

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This provides maximum benefit for the organization and interested parties. ISO 22000 is aligned with the requirements of ISO 9001:2000 in order to enhance the compatibility of the two standards, and to ease their integrated implementation.

- *Hazard control*

ISO 22000 combines the Hazard Analysis and Critical Control Point (HACCP) principles and application steps developed by the Codex Alimentarius, with prerequisite programmes. It uses a hazard analysis to determine the strategy for hazard control.

Advantages for the food industry

Organizations implementing the standard will benefit from:

- organized and targeted communication among trade partners;
- optimization of resources (internally and along the food chain);
- improved documentation;
- better planning, less post-process verification;
- more efficient and dynamic control of food safety hazards;
- all control measures subjected to hazard analysis;
- systematic management of prerequisite programmes;
- wide application because it is focused on end results;
- valid basis for taking decisions;

- increased due diligence;
- control focused on what is necessary; and
- saving resources by reducing overlapping system audits.

ISO 22000 can be applied to all types of organization within the food chain

Food you can trust

Other stakeholders will benefit from:

- confidence that the organizations implementing ISO 22000 have the ability to identify and control food safety hazards.

The standard adds value because it:

- is an auditable standard with clear requirements;

- is internationally accepted;
- is a publicly available scheme, not a proprietary one, that can be used by all;
- integrates and harmonizes various existing national and industry-based certification schemes;
- addresses a desire for harmonization from the food processing industries concerning food safety;
- is aligned with ISO 9001:2000, *Quality management systems – Requirements*, and ISO 14001:2004, *Environmental management systems – Requirements with guidance for use*, and the Occupation Health and Safety Assessment Series (OHSAS) and can also incorporate retailers' standards; and
- contributes to a better understanding and further development of HACCP.

About ISO 22000

ISO 22000:2005, *Food safety management systems – Requirements for any organization in the food chain*

- **ISO 22000 key elements**

- *Involvement of the management team*

Food safety is not just something to be handled by the quality department. It is a top management issue. ISO 22000 focuses on the involvement of the management team, which has to develop overall policy.

- *Communication*

As food safety hazards may be introduced at any stage of the food chain, interactive communication both upstream and downstream is essential. In addition, internal communication is a key element to avoiding misunderstandings and minimizing risks. A common vocabulary is a great help in this connection.

- *The HACCP (Hazard Analysis & Critical Control Point) principles*

ISO 22000 combines the recognized HACCP principles with prerequisite programmes. The hazard analysis determines a strategy and the prerequisite programmes set up an action plan.

- *System management*

ISO 22000 relies on a structured management system based on relevant parts of ISO 9001. It is possible to integrate them into one management system together with ISO 14001.

- **The development team**

ISO 22000 was developed by food safety experts from Australia, Canada, Belgium, Denmark, France, Germany, Greece, Ireland, Japan, the Netherlands, Poland, Sweden, Switzerland, Thailand, United Kingdom, USA, Venezuela, Vietnam, and liaison bodies such as the Confederation of Food and Drink Industries of the European Union (CIAA), amongst others.

A complete menu of standards

ISO 22000 is supported by a complete set of standards that reinforce its implementation.

- *Audit and certification*

To increase the acceptance of ISO 22000 and ensure that accredited certification programmes are implemented in a professional and trustworthy manner, the technical specification: ISO/TS 22003, *Food safety management systems – Requirements for bodies providing audit and certification of food safety management systems*, was published in 2007.

It provides the necessary information and confidence on how



the certification of an organization's food safety management system has been conducted. This technical specification offers harmonized guidance for the accreditation of certification bodies, and defines the applicable rules for the audit of a food safety management system compliant with ISO 22000.

- *Applying food safety*

ISO/TS 22004:2005, *Food safety management systems – Guidance on the application of ISO 22000:2005*, was published in 2005. It provides guidelines on implementing ISO 22000, with particular emphasis on good examples.

In 2007, ISO and the International Trade Centre collaborated to produce the book, *ISO 22000 Food Safety Management Systems – An easy-to-use checklist for small business – Are you ready?* It explains how small and medium-sized enterprises can use and implement ISO 22000.

- *Tracing the feed and food chain*

A new standard was published in June 2007 on traceability: ISO 22005:2007, *Traceability in the feed and food chain – General principles and basic requirements for system design and implementation*. It is a useful amplification of the reference in ISO 22000 to traceability as an important component of food safety.

ISO 22005 is intended for organizations operating or cooperating at any point in the feed and food chain. It does not contain any reference to certification nor is it combined with other stand-



The ultimate objective is to put safe food on the tables of the consumer.

ards. Instead, the possibility of certification is left to the user's discretion. However, the standard requires that organizations carry out monitoring, internal audit and reviews to assess the effectiveness of the system.

Other standards in the ISO 2000 family are being developed. They include a project for quality management for farmers, and a standard dealing with radiation of foods. More information can be given by contacting the ISO/TC 34 secretariat: uari@afnor.org.

Benefits of building food safety

Food producers in all parts of the world have adopted ISO 22000 as a new global food safety standard. Still, many small and medium-sized companies are waiting for the position of the three main market drivers:

multinational food companies, authorities, and retailers.

Some of the largest multinational food companies have been very positive about implementing the standard for themselves and their suppliers. Authorities in some countries plan to let certified companies benefit from less frequent controls, and perhaps consider an outsourcing of public control. The front runners in the work are authorities in Denmark and France. Retailers in Belgium and Denmark are already certified with ISO 22000, but greater communication on the benefits for retailers is still needed.

Driving forces for the future

It is important to create a common understanding of the benefits of building a food safety management system based on ISO 22000, for both manufac-

turing companies and retailers. This is being addressed by ISO/TC 34, *Food products* and food sector organizations for retailers, food producing companies and international certification bodies, among whom a bridging process has been initiated.

ISO 22000 contributes to a better understanding of HACCP

The driving forces for the future development of ISO 22000's implementation are, to a large extent, retailers, important food producers and national authorities. Future dialogue among them is needed. Authorities have to define food safety objectives for hazards like salmonella, coli bacteria and campylobacter, and companies need to incorporate control measures that ensure these acceptable levels are met.

Another challenge for the food industry is to manoeuvre between authorities, clients and internal company demands on how to make safe foods. ISO 22000 provides guidance on this never-ending question and now the ISO 22000 series provides a set of tools for use by all interested parties. These include consultants, certification bodies, accreditation bodies, public authorities and all players in the food supply chain, from farmer to retailer.

The ultimate objective is to put safe food on the tables of the consumer – you and me. Bon appétit!



Survey “incomplete” but reveals ISO 22000 implementation in 72 countries

Experts responsible for having developed the ISO 22000 series of standards have carried out an informal survey of ISO 22000:2005 certifications worldwide. Although incomplete, the survey shows that three years after the standards was launched, it is being implemented by at least 1 152 companies in 72 countries.



by Albert Chambers

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He is also President of Monachus Consulting, a firm dedicated to assisting Canadian agri-food businesses adapt and prosper.

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Eighteen years ago, the first of what was to become *The ISO Survey of Certifications* took place revealing the worldwide impact that the ISO 9000 series of quality management standards was having,

The experts who developed the new ISO 22000 of food safety management standards are as keen as those who developed the ISO 9000 series must have been to discover the answer to the question, “How is our baby doing?”.

This simple question led to the conducting of an informal survey by the ISO 22000 experts of food businesses certified to ISO 22000:2005. After exchanges of numerous e-mails, the list that was compiled has now gone through four editions. Because ISO 22000 certifications are performed by certification bodies that do so on a commercial



basis, independently of ISO – and in competition with each other – there is no official, central database.

The list compiled by the ISO 22000 developers is therefore incomplete and does not pretend to include all certifications. But it is a useful indication to the market take-up of ISO 22000.

The initial question was put by a member of ISO technical committee ISO/TC 34, *Food products*, working group WG 8, *Food safety management systems*, from France. He was curious as to how many countries had adopted ISO 22000:2005 as a national standard.

This led naturally to a second question to his fellow experts: how many food businesses have been certified in your country since ISO 22000 was published as an ISO International Standard in September 2005?

The incomplete answer to that question (and please remember that all the answers provided in this article are incomplete answers) was approximately 172. Not bad!

First certifications

The list included the first certifications – Danisco Sugar; a major airline catering facility – Air France; a large dairy, a winery, a beef slaughtering plant (Cargill) and a facility that provides meals to hospitals in Australia's largest city (Sydney); a hotel in India; a food processor in Indonesia; a feed manufacturer in Italy; a chocolatier in Japan; an ice cream manufacturer from Morocco;

a fish processor in Russia; a seafood further processor in Canada; and, a plant in one of the world's largest food companies – Kraft – in the United States.

The number of countries revealing ISO 22000 certifications has gone from about 24 countries to at least 72

At the same time, Danone, one of the world's largest providers of yoghurt and other dairy products had announced that it was planning to certify all its production sites to ISO 22000 and McDonalds Europe had established a list of accredited certification bodies for its suppliers to assist them to obtain ISO 22000:2005 certification. The first year looked pretty good indeed!

Thus was born an informal survey of the participants in the working groups that had developed ISO 22000:2005 – requirements for food safety management systems and, latterly, ISO 22003:2007 – requirements for audit and certification of food safety management systems.

The next survey, in early 2007, recorded 357 certifications in 45 countries. By the third quarter of 2007, contributors identified 715 companies in 57 countries.

In the most recent survey, completed in March 2008, the partial list runs to just over 1 150 food businesses in 72 countries. Again, pretty good for a new



Albert Chambers authored the recent publication (combined book and CD), *ISO 22000 Food Safety Management Systems – An easy-to-use checklist for small business – Are you ready?* Published jointly by ISO and the International Trade Centre (ITC).

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international standard emerging in competition, as it must, in an overly crowded field of private standards endorsed by major players in the food industry.

Establishing a non-proprietary, international set food safety management system standards that is applicable to the entire supply chain from input suppliers through primary production, processing, marketing and retailing, and encompassing all the steps from transportation to distribution, was the major impetus behind the development of ISO 22000, ISO 22003, ISO 22004 and ISO 22205.

Plethora

Food businesses had become increasingly frustrated by and food consumers were increasingly concerned about a plethora of proprietary standards that were outside the scrutiny and input of users and final customers.

A new family of ISO standards devoted to food safety and based on the internationally accepted approaches endorsed by the Codex Alimentarius Commission and by the World Trade Organization, was the obvious solution.

So, in early 2008, two and one-half years later, where are we? What does our informal and partial survey of food businesses tell us about the food businesses that have been audited and certified to ISO 22000:2005?

Just over 89.9% of the 1152 ISO 22000 certificates identified by the survey have been issued to food businesses that the standard would describe as being directly involved in the food chain. The other 10.1% include companies involved in manufacturing packaging, cleaning and sanitation of food businesses, transportation and distribution, grain handling, equipment manufacture and various services (see **Table 1**).

	# of certificates	% of certificates
Direct	1036	89.9
Indirect	116	10.1
Total	1152	100

Table 1 – Direct and indirect food chain participants.

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Those directly involved in the food chain include input suppliers such as animal feed manufacturers, a small number of primary producers (17 certifications in seven different countries) mostly in milk production, through a wide range of primary, secondary and tertiary food processors – dairy, poultry and the red meats, fish and seafood, vegetables and fruits, grains.

ISO 22000 has yet to be adopted widely in the retail sector, but a significant number of catering establishments running the gambit from small restaurants to large hotels, from school cafeterias to central kitchens serving networks of hospitals, have found the standard to be a useful tool (see **Table 2**).

There has been considerable growth in just 30 months

ISO 22000 is not yet as widely implemented as either ISO 14001, in use in 140 countries and ISO 9001 in use in 170 countries.

However, in just over 30 months, the number of countries revealing ISO 22000 certifications has gone from about 24 countries to at least 72 and probably many more. Turkey leads this survey with 200 establishments certified followed by Japan, India, Denmark and China (excluding Hong Kong) all in the range of 50 to 60 certifications issued (see **Table 3**).

Category	# of certificates
Catering	164
Food processor	149
Dairy processor	116
Beverage manufacturer/ winery	90
Meat/poultry processor	72
Ingredients	66
Packaging	54
Confectionary	51
Fruit and vegetable processor	46
Distributors and handlers	45
Feed manufacturer	32
Seafood/fish processor	25
Bakery	25

Table 2 – Top 15 categories.

Regionally, Europe leads the way with just under 60 % of the certificates (see **Table 4**). This is not surprising considering that it is the home of many of the private food safety management system standards and its food businesses have borne the brunt of multiple audits and certifications longer than other regions.

That the United States, Canada, New Zealand and Australia have witnessed fewer uptakes is also not surprising for several reasons. First, food processors in these countries are subject to government

inspection and many have had to implement HACCP as part of those regulatory requirements. Secondly, in North America implementation of food safety management systems all along the supply chain has yet to become mandatory as it has in Europe.

The Far East ranks second in certificates issued followed by Africa/West Asia in third place.

There is considerable variation in the category profiles of the 72 countries. Some have witnessed a wide range of food

businesses using ISO 22000. Others have seen certain sectors dominate. In Cyprus, for example all but two of the 27 certificates included in the survey have been issued to catering firms.

In Denmark, 22 out of 54 have gone to dairy processors, with Arla Foods being responsible for 19 of those. In those countries where a small number of certificates have been entered in the survey, such trends are impossible to identify.

Conclusions

Finally, this survey as has been mentioned in not comparable to the annual survey conducted by ISO of ISO 9001 and ISO 14001 certifications (the next edition of *The ISO Survey*, covering 2007, will also include ISO 22000:2005 certifications.).

Firstly, it is unofficial, having been conducted primarily amongst the members of the ISO/TC 34 working groups that developed the standard and ISO/TS 22003:2007. Secondly, certification bodies have differing policies about the release of information about the certificates they issue – some have been able to share or have published the information on easily accessible Web sites. Others have rules that prevent public access.

As a result, the information contained in the survey reflects the limited sources from which it was assembled. The full number of food



businesses certified to ISO 22000:2005 remains a mystery.

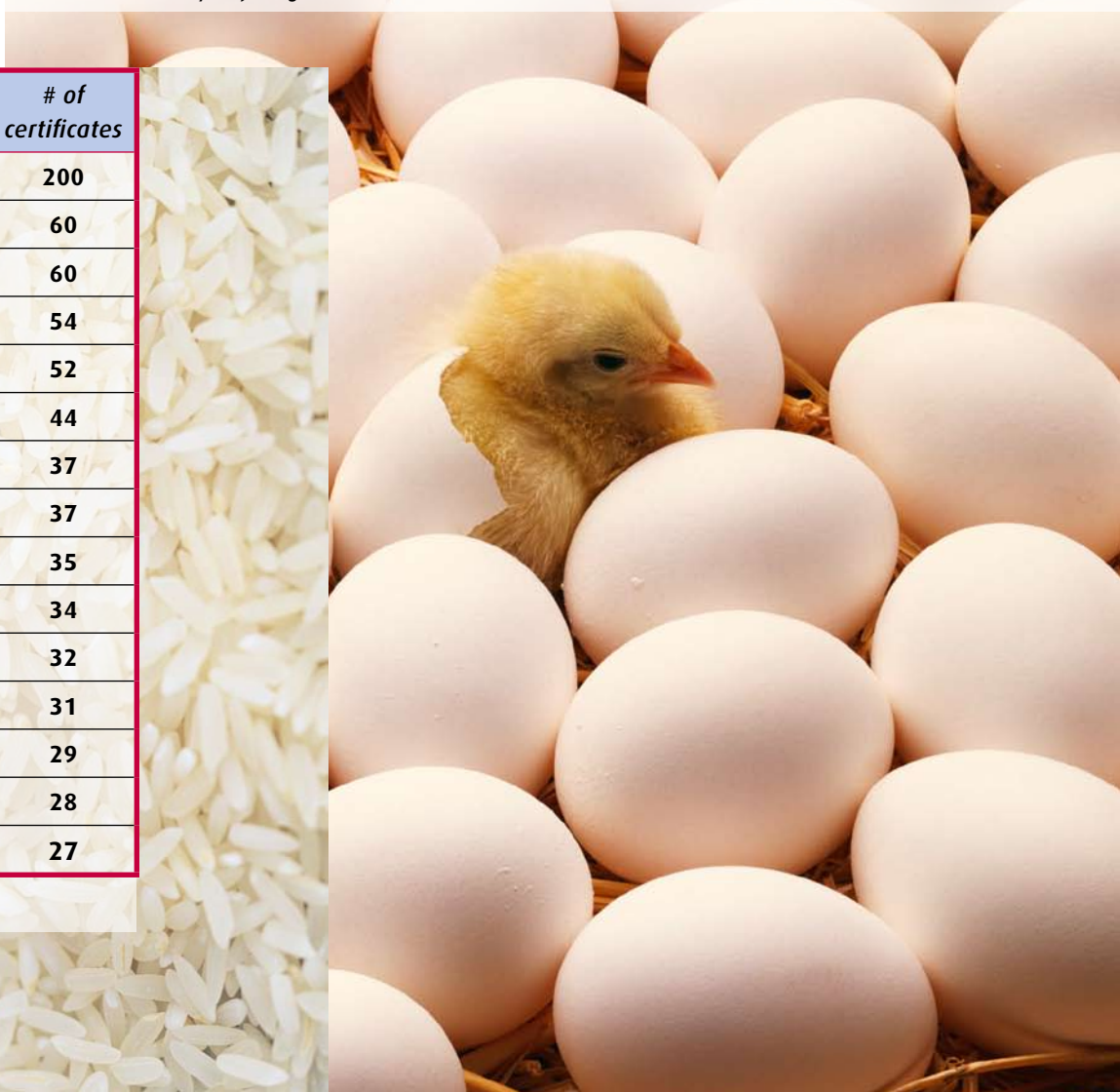
However, one can say that there has been considerable growth in just 30 months and that an increasing number of firms – from all along the supply chain and amongst its suppliers of goods and services – are choosing to use an international standard managing their food safety systems.

Region	# of certificates	% of certificates
Africa/West Asia	161	14.0
Australia/New Zealand	44	3.8
Central/South America	32	2.8
North America	22	1.9
Far East	232	20.1
Europe	661	57.4
Total	1 152	100.0

Table 4 - Certificates by major regions.

Country	# of certificates
Turkey	200
Japan	60
India	60
Denmark	54
China	52
Australia	44
France	37
Hungary	37
Greece	35
Romania	34
Sweden	32
Taiwan	31
South Korea	29
Italy	28
Cyprus	27

Table 3 - Top 15 countries.





World food giant Danone one of the earliest adopters of ISO 22000

France's Groupe Danone, an international leader in the food industry, particularly in the field of healthy nutrition, was one of the first global companies in the sector to launch an ISO 22000:2005 implementation programme. ISO Management Systems interviewed Dominique Berget (right), Danone's Corporate Food Safety Director, on the company's perspectives on the standard.



Dominique Berget, Danone's Corporate Food Safety Director: "ISO 22000 came at the right time and it constitutes a historical opportunity to be seized."



by Sandrine Tranchard

Sandrine Tranchard is a Communication Officer at the ISO Central Secretariat in Geneva

ISO Management Systems: *What are the reasons for Danone's involvement with ISO 22000?*

Dominique Berget: Food safety has always been an essential component of Danone's policy. Producing healthy foods and ensuring customer safety and satisfaction is our constant concern. Food safety is rarely mentioned and yet it is self-evident to everybody.

Danone is the result of the consolidation of food activities which had their own history and their own management system. Prior to ISO

22000, Danone already had a food safety management system which had been implemented in every company of the Groupe Danone. Today, the group operates in some 60 countries which have varying levels of health and safety and environmental requirements.

A form of standardization of food safety management had to be achieved in order to be consistent internally and to promote dialogue with public health authorities, consumer organizations and, eventually, large-scale retailers.

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Hence the relevance of an ISO standard that would be recognized all over the world in all countries in which we operate and would offer the possibility of obtaining an independent third-party certification, in accordance with the group's good governance principle. This is the overall context in which we worked.

IMS: *What were the main steps of the ISO 22000 programme at Danone?*



Dominique Berget: We started to study ISO 22000 in 2003 [Editor's note – when the standard was still under development] through a benchmarking analysis with the standards that already existed on the market. We then performed gap analyses of the existing situations at three pilot industrial sites and implemented action plans in order to bring them into conformity with the new standard.

Subsequent informal internal audits enabled the teams to familiarize themselves with the ISO 22000 approach. The first audits of sites were conducted at the end of 2005. Our assumptions about the relevance of the standard proved to be right and I therefore decided to structure the Danone Corporate Food Safety Division, which is under my responsibility, in order to obtain the ISO 22000 certification, which we eventually did in May 2006.

Common management system

This certification served as a test, but also represented our willingness to implement throughout Danone's activities a common management system based on ISO 22000.

This certificate covers the Danone Food Safety Centre – the specialized department in charge of food risk assessment. It is also the starting point of the first management process called IRMA (Integrated Risk Manage-

ment and Assessment) covering the group as a whole, from risk assessment to risk management at the level of industrial facilities.

IMS: *What were the challenges in applying the requirements of the standard to Danone's specific context?*

Dominique Berget: There is no specific challenge for Danone but rather the opportunity to ask ourselves the right questions when implementing the system. The definition of processes during this implementation phase raises a number of issues, which are all the more interesting as they help reinforce the system's robustness.

IMS: *How does ISO 22000 fit with other management certifications within the Groupe Danone?*

Dominique Berget: ISO 9001 has been used in the group since approximately 1994, depending on the departments. We adopted the 2000 version as soon as it was published. The choice of ISO 22000 was made at the end



Danone is world leader in a number of sectors, including dairy products

Groupe Danone

Groupe Danone is one of the most dynamic companies in the food sector. Its products are present in more than 120 countries on five continents. In 2007, the group, which has some 150 production sites and employs 76 000 staff, posted sales of EUR 12.7 billion.

Danone holds leading positions in healthy nutrition, around four core sectors: **dairy products** (n° 1 worldwide), **water** (n°2 in the bottled water market), **baby food** (n° 2) and **clinical nutrition**.

Listed on the Paris Euronext, Groupe Danone is also listed in the main social responsibility indices: Dow Jones Sustainability Index Stoxx and World, ASPI Eurozone and Ethibel Sustainability Index.



of 2004, before the standard was even published, i.e., when it was still at draft stage. We immediately understood its obvious significance because this standard represented the missing link in the food safety management system.

“ISO 22000 certification recognized throughout the world is a major asset to a company.”

ISO 22000 combines and coexists with the management systems implemented at Danone, particularly ISO 9001 and ISO 14001. In this respect, the future development of

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ISO 9001 should help us in our endeavour to match ISO 9001, ISO 14001 and ISO 22000 in terms of structures.

The next review of ISO 9001 should take into account the necessary convergence of the systems, in order to allow for a common management when needed.

whole industrial activity of the group's companies.

Strong points

IMS: *How do you see ISO 22000 nowadays?*

Dominique Berget: There are two sides to this question. On the one hand, the strong

The second point is that ISO 22000 clearly defines the steps: hazard analysis, risk assessment, definition of critical limits, implementation of PRPs* (Prerequisite Programmes), implementation of the HACCP plan and also, management of associated elements that are essential to a food safety steering device.

The third strong point of this standard lies in the fact that its implementation creates a common language throughout the food chain, both upstream and downstream, from farming activities to distribution, thereby facilitating food risk management. Stakeholders

ities and contributes to strict regulatory compliance.

ISO 22000 combines and coexists with ISO 9001 and ISO 14001

Finally, ISO 22000 helps us fulfil our due diligence duty concerning food safety, i.e., our obligation to take all possible steps to guarantee, and be able to demonstrate, food safety.

The potential improvements that could be made to ISO 22000 relate to the above-mentioned PRPs that are



IMS: *How many sites are now certified to ISO 22000?*

Dominique Berget: Our objective is to have every subsidiary in every country, as well as their corresponding plants, certified to ISO 22000 in order to achieve better consistency in our management throughout the world. Some 30 Danone sites, as well as industrial sites and a number of group companies in the world, are now ISO 22000-certified.

The group's Corporate Food Safety Division has been certified since 2005 and we have given ourselves two years to obtain certification for the

So far, some 30 Danone sites are ISO 22000-certified and the group aims to have food safety management systems certified to the standard in place at all its industrial activities worldwide.

points of the current standard and, on the other hand, the developments that could improve it.

The first strong point of ISO 22000 is that it enables organizations to structure their Hazard Analysis and Critical Control Points (HACCP) management dynamically by relying on processes. We should bear in mind that HACCP is at the heart of ISO 22000.



at every level can then manage their own risks, with full knowledge of the risks that have already been considered upstream.

This standard brings all actors together around a common language in every country where Danone operates and this constitutes a strong point. It clarifies and simplifies exchanges with public author-

now mentioned in the standard, yet with a very succinct definition.

Structuring PRPs is a prerequisite to HACCP. The PRP approach in the current context of ISO 22000 is mainly based on the Codex Alimentarius principles.

We therefore deemed it necessary to back it up with a



benchmark providing a clearer description of what PRPs should be. To that effect, in collaboration with the British Standards Institution (BSI), we participated in the drafting of a document with the idea that it would become a Publicly Available Specification (PAS)** which could be used in the context of future ISO 22000 certifications to simplify and clarify the management of the PRPs.

In my opinion, the main development could be this PAS PRP document, which should be finalized by the end of the year and hopefully incorporated during the next review of ISO 22000 as a reference document. This would make the task of the food industry easier in implementing ISO 22000, and would provide a better visibility of the true performance of the standard to both public authorities and retailers.

Global recognition

I am convinced that ISO 22000 came at the right time and that it constitutes a historical opportunity to be seized. We should make sure that HACCP, as the true driver of food

* PRP: prerequisite programme: food safety basic conditions and activities that are necessary to maintain a hygienic environment throughout the food chain suitable for the production, handling and provision of safe end products and safe food for human consumption.

** PAS: An ISO/PAS (Publicly Available Specification) is one of several alternatives to fully fledged International Standards offered by ISO for cases where market needs dictate priority for swift development and publication.



This standard brings all actors together around a common language in every country where Danone operates.

safety management, is included in a continual improvement process, enjoying global recognition and that can be validated by a third party.

Abroad, the ISO 22000 certification recognized throughout the world is a major asset to a company. This is also true of every supplier with whom dealings will be simpler with a common language and a similar approach. This should simplify supplier approval procedures and significantly reduce the specific audits that we have to perform.

Likewise, ISO 22000 should give confidence to retailers that procurement is guaranteed on the basis of solid foundations supported by independent third-party audits enjoying worldwide recognition.





Kraft Foods evaluates ISO 22000 as global standard for ensuring food safety

With net revenues of USD 37 billion, Kraft Foods Inc. is one of the world's largest food and beverage companies, with consumers of its products in more than 155 countries. Kraft Foods sees ISO 22000 as the best vehicle for winning acceptance from its stakeholders worldwide for a single food safety management system standard, and has initiated pilot projects in Europe and the Asia/Pacific region.

by Peter Overbosch, Andre Luis Lozano and Steve Mould



Because food safety is a top priority for Kraft, we have implemented a comprehensive food safety management system (FSMS) as a part of our global quality chain management system, which is organized along the lines of ISO 9001 and covers all relevant quality and safety aspects of food manufacturing.

However, the lack of a food safety specificity of ISO 9001 limits its suitability in the context of food safety assurance towards external stakeholders. This is why Kraft welcomed the publication of ISO 22000, a globally recognized, auditable standard for FSMS.

Core standards

Like all food manufacturers, we have an obligation to our customers and consumers to offer safe, consistent and



wholesome products, in compliance with applicable laws and regulations. Our existing quality and food safety systems were developed largely on the basis of a core set of internationally recognized standards, including:

- ISO 9001 for general quality management systems. Our global quality chain management system was structured in accordance with the ISO 9001 framework, and our manufacturing sites are ISO 9001 certified
- Codex Alimentarius for general hygiene and food safety systems. The Kraft HACCP (Hazard Analysis and Critical Control Points) and GMP (Good Manufacturing Practices) manual follow the Codex HACCP format and GMP requirements, and add a series of specific requirements applicable for our materials and processes
- European Hygienic Engineering & Design Group (EHEDG) and Sanitary Standards, Inc. (3A) hygienic manufacturing guidance
- microbiological standards and methodology through the International Commission on Microbiological Specifications for Foods (ICMSF) and the National Advisory Committee on Microbiological Criteria for Foods (NACMCF).

In addition, Kraft operates systems to assure compliance with regulations in the countries in which we operate, as well as incident management systems for which no authori-

tative international standard is currently available.

Most major food company quality and food safety systems are highly similar. Variations arise mostly from working with different materials and technologies, derived the hard way from experience, and from the ways implementation is organized.

The standards mentioned above might suffice if food companies were entirely independent, rather than being linked directly or indirectly through customer relationships, shared suppliers, retailers, consumers and logistics operations. Each company develops its own systems using the same sources of inspiration, while health authorities inspect the entire industry and we have an efficient, largely aligned and self-correcting food production infrastructure.



About the authors



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Recognising a lack of food safety specificity in ISO 9001, Kraft Foods have welcomed the publication of ISO 22000, a globally recognized, auditable standard for food safety management systems.

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Trusted networks

In practice, however, the food industry is highly interconnected. Companies are partnered with one another throughout the chain, from primary production of raw materials all the way to selling – and even serving – the finished food to the consumer. Fulfilling our obligations to customers and consumers requires each of us to scale up our systems to cover all partners, building trusted networks from farm to fork.

These networks are held together by standardization, transparency and independent auditing and certification.

As a result, the industry now faces three primary problems in relation to food safety standards and trusted networks:

- 1) Not all the internationally recognized standards referred to above were necessarily drafted for auditing and certification purposes.
- 2) The complete set of documents was not developed as a coherent whole.
- 3) Large operators could – and were in practice obliged to – fill this gap in auditing, certification and systems integration by building their own trusted networks.

This has resulted in a proliferation of proprietary standards with only minor differences, and a variety of auditing and certification systems. Smaller suppliers with multiple large customers are forced to undergo an almost endless series of largely interchangeable audits which, according to

About Kraft Foods

With net revenues of **USD 37 billion**, Kraft Foods Inc. is one of the world's largest food and beverage companies. For more than 100 years, we have offered consumers delicious and wholesome foods that fit the way they live.

Kraft markets many of the world's leading food brands. We have **seven** brands with revenues exceeding **USD 1 billion** and more than **50** brands with revenues over **USD 100 million**. More than **40** of our brands are at least 100 years' old. We have more than **90 000** employees and **159** manufacturing and processing facilities worldwide.

Millions of times a day, in more than **155** countries, consumers reach for their favourite Kraft brands.



Kraft Foods

the Grocery Manufacturers of America, add several billion dollars a year in unnecessary costs for the food industry.

Even for large manufacturers like Kraft Foods, this approach is ultimately not sustainable. Too many auditors are required, too many audit findings need to be addressed, and there is little possibility of synergy with other major system owners.

Rationalized approach

Against this background, Kraft Foods has decided to rationalize its approach, making *focus* and *adherence to internationally accepted standards* the key considerations.

Focus

Food safety is our primary focus and our main criterion for accepting or rejecting sup-

pliers. We felt that the same should apply in relations to our customers, so we have been looking for a single food safety certification system acceptable throughout the entire food chain.

Adherence to internationally accepted standards

The system should enable us to certify food safety, but not reinvent the underlying standards and methodologies.

This requires:

- *Transparency*: we want to demonstrate to our partners and stakeholders that we have implemented state-of-the-art food safety systems. The system of choice should therefore involve external certifiers that are globally recognized as competent and independent.

- *Independence*: bringing all our current and future partners within an exclusive Kraft system is not practically sustainable, and developing a “manufacturers’ system” with our industry colleagues will not end the current proliferation of systems. The only way to gain universal acceptance and reap the potential synergies of such a system is to adopt one that is truly independent of any particular stakeholder group.
- *Self-sustainability*: at its most basic level, the system should work in the same way as driving licenses do: it is up to the individual (company) to qualify for it and maintain the conditions to keep it.
- *Flexibility*: the system should allow for specific customer requirements to be taken into account, without the need for additional audits or certificates.

Comparing the available certification schemes against these criteria, we have decided that ISO 22000 is the preferred food safety standard for Kraft's purposes.

Few modifications required

We have therefore started a pilot project covering our 12 coffee manufacturing sites in Europe and several sites in the Asia/Pacific region. HACCP in coffee is relatively simple because roast and ground coffee is not microbiologically sensitive, but the exercise gave us the opportunity to:



- test compliance of our corporate policies and procedures (the Kraft HACCP manual and our organizational structure around food safety in general) against ISO 22000 requirements;
- have an independent check on complete and compliant implementation at each site. (We passed, with very minor adjustments).

This pilot project provided guidance in the value of effective co-operation with our certifier: strict planning, effective and timely communication, and distinguishing between issues that require a central discussion between Kraft Corporate Quality and our certification body on the one hand, and topics that are best discussed at the individual site level on the other hand.

Having completed our pilot project successfully, our conclusion is that the Kraft systems required little if any modification to comply with ISO 22000 and that we feel confident about this new standard being the right choice for our purposes.

Prerequisite programmes

However, in trying to make ISO 22000 work across the entire food network, we discovered that the issue of Prerequisite Programmes (PRPs) needed to be resolved. Implementation of PRPs is explicitly required in ISO 22000, but until now no PRP standard has been provided within the ISO 22000 series framework. Without agreed PRPs, ISO 22000 certification would clearly not

be acceptable to stakeholders across the industry.

We are attempting to resolve this issue through an industry initiative, where a PRP document has been drafted by a small team of manufacturers, including Kraft, with input and critical comments from a wide range of manufacturer representatives across Europe (through the Confederation of the Food and Drink Industries in the EU) and retailers and certification bodies (through the Global Food Safety Initiative).

The resulting final draft PRP document will now be developed further to the status of an official standard, so that companies can seek combined ISO 22000/PRP certification. Once official, the PRP standard will not be owned by the original authors of the draft, or by any stakeholder group in the food value chain. This will make the standard truly independent.

Specific customer requirements

This leaves the element of flexibility, or specific customer requirements (SCRs). These requirements are normally highly specific to products, materials or markets, and this limited applicability means they would not be included in the ISO 22000/PRP standard itself. Integrating SCRs within a company quality and food safety system would allow them to be covered within the scope of the ISO 22000/PRP certification without requiring additional auditing or further specialised certification.



Covering ISO 22000/PRP and SCRs through a single external audit and a single certificate would create a system that fulfils all of the requirements outlined above, and should be acceptable throughout the industry. This will allow all participants in the food value chain to “get their driving licenses” while leaving room for fine-tuning where appropriate.

For Kraft, this will mean that we can truly rationalise our efforts and focus on our business drivers:

- Customer-supplier relations, up and down the value chain, can be covered through the combination of ISO 22000, PRP and SCR.

- Our internal food safety efforts can be focused on scientific and technological advances, leaving much of the systems and compliance efforts to manufacturing sites that are operating under the ISO 22000/PRP/SCR system.

- Our own auditors can focus on in-depth improvement opportunities instead of compliance.

Kraft Foods is determined to assure food safety, audited and certified externally and transparently, but at the same time to reduce complexity in our relations with customers, suppliers and external manufacturers. We expect ISO 22000 to help us achieve that goal.



World's largest veal producer to implement ISO 22000 at all its facilities

The VanDrie Group, which is the world's leading veal producer, is embarked on a programme to certify all its facilities to ISO 22000 in order to upgrade further its state-of-the-art integrated food quality and safety system.



by Henny Swinkels

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ID numbers assigned to calves at birth allow VanDrie Group to track individual animals from farm to supermarket.





In the early 1960s, Jan Van Drie purchased his first newborn calf for fattening. Today, the family-owned Dutch company he founded is the world market leader in veal and calf milk replacer, and an enterprise built on the best family traditions.

With more than 20 companies, the VanDrie Group is the largest integrated veal producer in the world, providing about 20 % of all European veal. Backed up by Safety Guard, a unique integrated chain management system, nearly 1.4 million calves are processed each year. More than 95 % of production is exported all over the world.

Respect for man, animal and quality has been part and parcel of the VanDrie Group for generations. These values lie at the heart of our professional approach and partnership, and they are the starting point for the final product.

Strict controls

The VanDrie Group currently controls more than 1 000 calf-husbandry operations, and the Group's calves originate exclusively from these controlled farms. The VanDrie Group is an ardent supporter of loose housing, which means that calves are accommodated in groups in spacious, well-ventilated and well-lit stables.

Specialised supervisors support the farmer in his work. Continuous research yields the latest ideas, which are then put into practice on the farms. Modern management systems



Safety Guard, the VanDrie Group's food safety and quality system, is being integrated with the ISO 22000 standard.

ensure the consistently high quality of the product. The "Controlled Quality Veal" logo is guaranteed by our own integrated quality system, Safety Guard.

The European Commission-accredited *Stichting Kwaliteitsgarantie Vleeskalversector* (Veal Sector Quality Guarantee Foundation, or SKV) carries out strict controls for prohibited substances.

At the VanDrie Group, production follows a custom-

ised approach, which starts at the farm, where calves are selected by species and origin according to the customer's requirements. All veal products are made to client specifications, which may relate to confirmation, weight and colour of the meat. Any cut can be produced when the meat is being processed. Packaging, including boxes, foil and product-information stickers, is also produced according to client specifications.

ISO 22000 certification allows us to manage and control food safety aspects in every link of the production chain

The VanDrie Group is headquartered in Mijdrecht, The Netherlands.

Two of the Dutch slaughterhouses in the VanDrie Group, T. Boer & Zn in Nieuwerkerk a/d IJssel and Ekro in Apeldoorn, are among the largest veal abattoirs in the world.

End-to-end protection

Safety Guard is the integrated food quality and safety system of the VanDrie Group. Safety Guard guarantees food safety throughout the production chain, from purchase of the newborn calf, husbandry and calf milk replacer production to slaughtering, deboning, processing and packing of the veal.

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A unique feature of the VanDrie Group slaughterhouses is that each cut is linked to a unique identification number given to the calf at birth. This ID number is also on the product label, enabling all details to be traced back to the individual animal and traced forward to an individual piece of veal in the supermarket.

VanDrie Group is also able to trace the raw materials used in production of the calf milk replacer given to individual calves.

The system is based on the Hazard Analysis and Critical Control Point (HACCP) system and ISO standards, and is implemented throughout the VanDrie Group chain. The VanDrie Group is the first chain producer with a complete food safety supply chain system based on the Food Supply Chain Requirements, a standard developed and certified by Lloyd's Register Quality Assurance.

ISO 22000 a natural step

The VanDrie Group decided in 2005 to implement the ISO 22000 programme, seeing the standard as a natural step in integrating food safety into other ISO programmes. Food safety is part of many quality systems, including the British Retailer Consortium (BRC), HACCP, Good Manufacturing Practices, ISO 9001 and Integrated Chain Control (IKB).

All these systems have their own schemes, which may generate risks of uneven levels of food safety, confusion over requirements, and increased



VanDrie Group is able to trace the raw materials used in production of the calf milk replacer given to individual calves.



costs. As a participant on the global market, we are obliged to conform to multiple programmes, and harmonizing these requirements affords an opportunity to improve our quality system.

Through international consensus, the ISO 22000 system specifies requirements for any organization in the food chain. This offers us a unique solution for good practices on a worldwide basis. ISO 22000 integrates the ISO 9001 quality management require-

ments with the principles of the Codes Alimentarius Commission's HACCP system for food hygiene.

Controlling every link

With the Safety Guard system, the organization had already incorporated all the quality systems with their requirements, and adapting the system to the requirements of ISO 22000 was a relatively small step. In the first quarter of 2006, the first companies

were certified to ISO 22000. Five VanDrie Group companies are currently certified to ISO 22000, and we plan to certify all of our Dutch companies before 2009.

Completing ISO 22000 certification allows us to manage and control food safety aspects in every link of the production chain. Involvement of everyone in the VanDrie Group – from veal farmer, production employee to management – is necessary to achieve the goals of the ISO 22000 programme.

In developing a greater benefit for the company it is very important that the ISO 22000 system will be the leading programme to guarantee food safety throughout the production chain. The VanDrie Group therefore encourages all suppliers to implement a food safety system like ISO 22000. Suppliers with approved ISO 22000 food safety systems may become preferred suppliers to the VanDrie Group.

It is also very important that retail organizations and regulatory bodies accept ISO 22000 as a food safety system.

Although ISO 22000 is a good step in the right direction, we believe that there is still a lot of work to be done. Acceptance of the programme throughout the production chain and all organizations involved in food safety is a primary concern of the VanDrie Group. For VanDrie Group, its customers and control bodies, ISO 22000 is the best system for continual improvement of food safety. •



Arla Foods sees ISO 22000 becoming **international benchmark** for food safety

by Pär Junedahl,
Erik Øgaard, Harriet Alnås
and Ulla Nilsson

With production in 12 countries, sales offices in 27 countries, and products on the market in more than 100 countries, the Scandinavian dairy cooperative Arla Foods is migrating to ISO 22000 which it sees as eventually replacing national standards for food safety.

About Arla Foods

Arla Foods is a dairy cooperative owned by approximately 8 500 milk producers in Sweden and Denmark with production in 12 countries, sales offices in 27 countries, and products on the market in more than 100 countries.



Arla Foods is a global company, although the United Kingdom, Sweden and Denmark are the company's main markets.

In Northern Europe and the United Kingdom, we supply a wide range of products. We also export many products globally, adapted for local markets. Arla Foods supplies retail and food service products, as well as milk-based ingredients for the food industry.

Arla Foods has about 16 600 employees worldwide, with two-thirds working in Scandinavia, and 85 % in our home market areas of Denmark, Sweden and the United Kingdom.



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Arla Foods' decision in 2004 to adopt ISO 22000:2005 (even before the document was finalized) as a corporate standard for food safety is an extension of its long experience with management standards spanning the entire food chain – from the farm and other suppliers to the consumer.

Food safety

In our mission statement, Arla Foods promises “to offer modern consumers milk-based food products that create inspiration, confidence and well-being”. The emphasis on confidence and well-being directly addresses matters of



The food safety assurance systems Arla Foods has had in place since before the development of ISO 22000 have been based on national and international standards, including Hazard Analysis and Critical Control Points (HACCP), British Retail Consortium (BRC) and the International Food Standard (IFS).

All Arla Food dairies in Scandinavia will now be required to achieve certification to ISO 22000 during the first half of 2008, and our aim is for our sites in the United Kingdom and most of our international dairies to be certified no later than 2009.

Arla Foods implements ISO 22000 to ensure food safety from the farm, via the supply chain, to the consumer.

food safety. It is essential that our operations and products do not cause harm to consumers, customers or ourselves – as persons and as businesses.

This focus on food safety creates confidence in our company, and it is a key to improved business performance.

Arla Foods' food safety policy stakes out high standards throughout the value chain. This means that we must strive to involve everyone from milk producers and other suppliers

The HACCP system

HACCP (Hazard Analysis and Critical Control Point) was first developed in the 1960s by Pillsbury Company in conjunction with the National Aeronautics and Space Agency (NASA) and the US Army Labs at Natick. The objective was to produce food that was as safe as possible, so that the food used by astronauts was not contaminated by pathogens, toxins, chemicals or foreign hazardous objects.

HACCP reduces the likelihood of food-borne illness by identifying hazards and assessing risks associated with foods through any or all links of the food chain, from production to consumption. It ensures that all the high-risk operations are under control.

operate, there are other regulations based on national or international legislation.

The *Arlagården* programme specifies Arla Foods' requirements not only for food safety and milk composition, but also for animal welfare and environmental protection. The programme also specifies requirements for documentation.

The precautionary principle is applied on all farms supplying milk to Arla Foods, with safety considerations given a high priority and a clear focus on risk assessment and risk management. Auditors conduct site visits to the farms to gauge compliance with the programme's requirements.

We see ISO 22000 as the umbrella for food safety standards

to production and delivery chains – all the way to the consumer. It also entails understanding our consumers' point of view and acting proactively to address any issues that may cause concern.

From farm to dairy

Milk is the major input for Arla Foods products, and the company is co-operatively owned by some 8 500 milk farmers.

As an important part of our efforts to fulfil the company mission, we have, together with our owners, established a quality programme entitled *Arlagården* (“the Arla farm”) to be used by our farmers in Denmark and Sweden. In the other countries in which we

Milk collection and transportation is covered by an HACCP plan, which is not ISO 22000 certified, but based on the requirements of the standard. Together with internal agreements “and self-inspecting follow up-systems”, this plan provides the basis for delivery of safe, high-quality milk to the dairies.

An evaluation programme set up by our procurement department covers other raw materials supplied to Arla Foods, including food ingredients, packaging materials and cleaning agents. Each dairy's HACCP includes evaluation of these raw materials and how they are used.



At the dairies

All Arla Foods production sites in Denmark and Sweden are now covered by ISO 22000-certified HACCP systems. We see ISO 22000 as the umbrella for food safety standards, and we hope that ISO 22000 will replace food retailer standards like BRC and IFS over time.

The ISO 22000 standard is better known and more widely accepted than any national standard (such as the former Danish HACCP standard DS3027), and our customers are already beginning to recognise ISO 22000. Some Swedish retailers accept a relinquishing of BRC requirements when ISO 22000 has been implemented. A reduction in the number of standards cuts certi-

fication costs, freeing resources to focus on risk assessment and control measures of relevant hazards.

For us, it was important not only to focus on food safety but also to show “one face to the customer”, and to communicate our common hazards and control measures, internally and externally, in a simple and understandable way.

To achieve these goals we developed “Arla Food Code of Practice for HACCP”. This code of practice is used at the dairies and for distribution of the milk from farm to dairy. The plan calls for product development units to use the tool in the early stages of the development process, conducting final risk assessment



All Arla Foods dairies in Scandinavia will be required to achieve certification to ISO 22000 during the first half of 2008.

About the authors



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together with the dairy. By using the same tool we gain an improved understanding of the potential hazards and secure focus on control measures needed along the food chain.

Appropriate materials for production of animal feed contribute to the safety of food for human consumption. At Arla Foods' fresh product dairies in Sweden, by-products are also included in the food safety management system.

We are also using ISO 22000 in a major development project for raw milk cheese. Pathogenic

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microorganisms are traditionally killed off by pasteurisation, and eliminating pasteurisation as a control measure required adoption of other alternatives for controlling these hazards. We have developed highly detailed prerequisite programmes for the farmers, and advanced simulation models for growth and death of potentially pathogenic microorganisms to define performance objectives in the food chain.

Most importantly, we have produced a clear communication and management plan for farmers and dairies regarding nonconformities, bacteriological results and improvements.

Legislation

European Union (EU) food regulations encourage development of industry-specific guidance to support fulfilment of

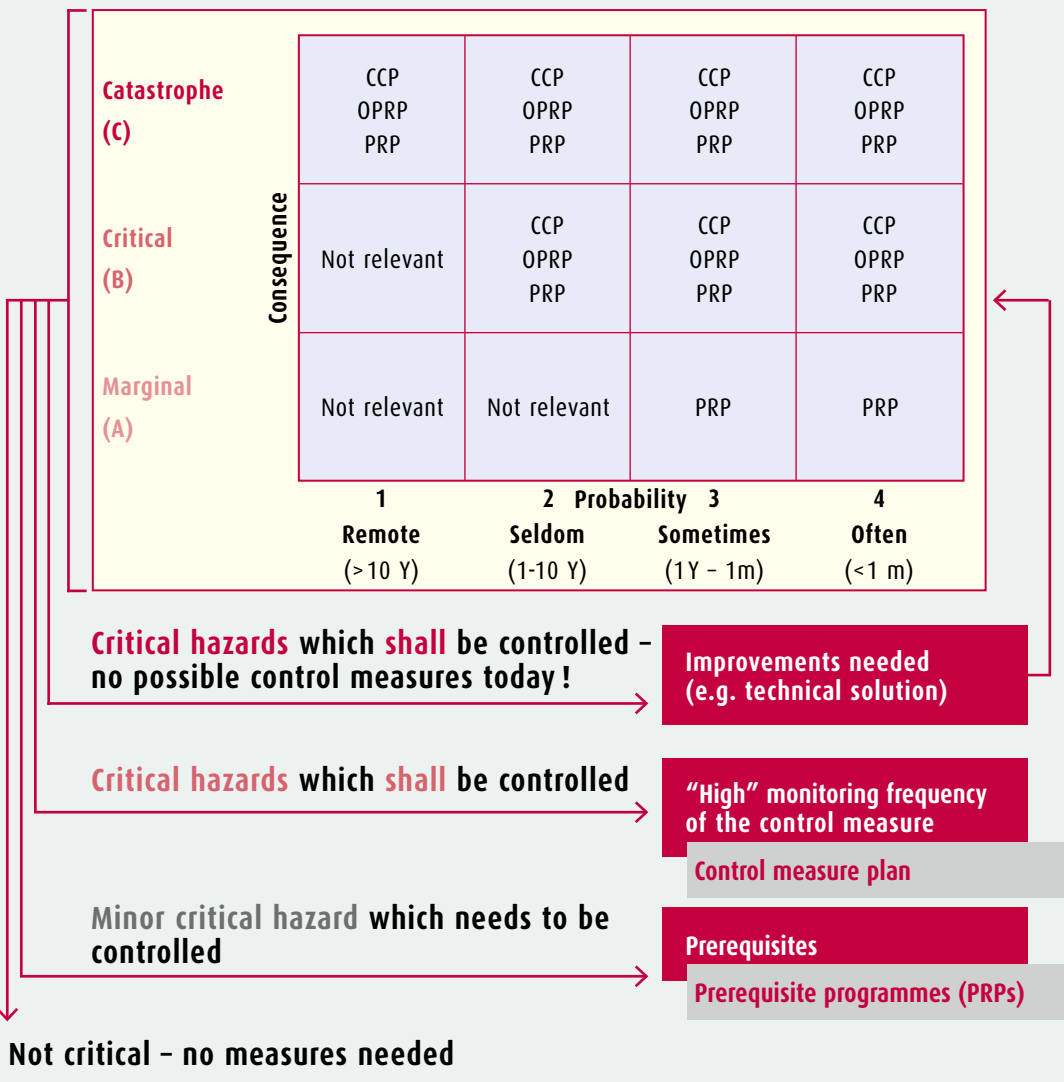


food safety requirements. This shall be done by implementing and maintaining the HACCP principles and procedures for good hygienic practice.

Dairy companies in Denmark and Sweden, together with the national milk boards, have produced national branch codes – which in both countries has been approved by the national authorities.

Although they vary in structure, the two branch codes fulfil the demands of EU legislation as well as the national guidance to the EU legislation. Both are in compliance with ISO 22000, which serves as the tool for describing the branch codes for the authorities

Hazard analysis:



Code of Practice for HACCP

In 2004, we established a working group to focus on a common HACCP tool for Arla Foods, basing the Code of Practice (COP) on the coming ISO 22000 standard. Arla approved the final COP in October 2005. The accompanying graphic (see **Figure 1**) illustrates the workflow employed for risk assessment and deciding on the appropriate control measures.

During our work, we discovered that it was sometimes difficult to identify the correct control measures on the basis of risk assessment (consequence and probability). We found that even hazards with high consequence and high probability sometimes can be controlled only by prerequisites, including manually cleaning equipment to prevent growth of pathogens such as Listeria on equipment surfaces and products.

Figure 1 – Workflow for risk assessment and deciding on the appropriate control measures.

PRP – prerequisite programme OPRP – operational prerequisite programme CCP – critical control point



Implementation procedure

Implementation of ISO 22000 began with a pilot project at one of our dairies during 2005, giving us an opportunity to test the draft of the standard and of our COP. The main milestones of the one-year implementation process were:

- gap analysis between the local system, ISO 22000 draft and Arla COP
- two consultancy visits (every 3-4 months), with corrections of the local system between visits
- pre-audit and corrections according to the latest changes in ISO 22000 drafts (the COP programme was carried out when the standard was still under development)
- certification.

Implementation of ISO 22000 for the rest of our Scandinavian cheese and butter dairies was a relatively simple process. All of the dairies were already certified to DS 3027 and ISO 9001. To visualise the differences between DS 3027 and ISO 22000, implement the COP and learn from the pilot project, we held courses at selected dairies in early 2006.

Most of the dairies changed their DS 3027 certificate to ISO 22000 during 2006. This took place during normal surveillance or re-certification audits, although the time frame of the audits was extended.

The Swedish fresh milk dairies encountered new customer demands in the middle of the

1990s, which led to implementation of HACCP systems. A few years later, these local HACCP systems were integrated with the ISO 9001 management systems already implemented at these dairies. The scope of the quality management system was set mainly by the existing HACCP system. During the

following years, environmental and energy management systems were added.

The local systems were then integrated into a common management system for the eight Swedish fresh product dairies – including top management – with described interfaces to other parts of the company,

for example marketing and research and development.

The documents shared in the management systems, both common and local, are all accessible in a common electronic documentation system. These changes made the management system more effective and efficient, with multi-site



Production line at an Arla Foods dairy. All of the company's dairies in Scandinavia will be required to achieve certification to ISO 22000 during the first half of 2008.

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Arla Foods sees ISO 22000 as a tool to communicate common hazards and control measures in a simple and understandable way for employees as well as external stakeholders.

audits being one example of improvement.

Implementation of the Danish HACCP standard DS3027 began at the Swedish fresh product dairies in 2004. During this implementation project, the goal of certification changed from DS3027 to ISO 22000.

From the beginning, the approach has been to create a food safety management system with as many common parts as possible. The dairies involved worked like a relay team to produce allotted parts, and this work was completed and enhanced by representatives from the other dairies.

In addition to the common corporate policies and code of practice for HACCP, the dairies could agree on detailed common parts and descriptions of the system. The prerequisite

programmes and HACCP plans (one for each product type) are shared as common documents with references to local routines and responsibilities.

The dairy industry in Sweden has also agreed on a national industry standard for best practice of hygienic production, approved by the National Food Administration. This is a useful tool when interpreting the ISO 22000 standard for creation of a common system for several dairies.

Our experience is that the similarities between ISO 9001, ISO 14001 and ISO 22000 have made the integration into a single management system easier. With simple adjustments, existing parts could fulfil the demands of the new food safety standard.

Suggestions for improvements

Our implementation experience leads to these conclusions:

- The risk assessment would be more easily interpreted if it was better described in the standard, especially the link between consequences and probabilities, and the

Conclusion

The ideal situation for Arla Foods would be to have a single standard for food safety. The risk assessment methodology in HACCP is basic in all food safety analyses, and as we are working in a global context the international ISO 22000 standard is well suited to our company.



chosen control measure – prerequisite programme (PRP), operational prerequisite programme (OPRP) or critical control point (CCP). More examples and guides in this area would be beneficial.

- For the farmer and “small producer”. the standard appears too complicated.
- For those who prefer to work with quantitative HACCP and operative objectives in the food chain, the standard could be more supportive.
- An appendix for production facilities is needed in order to replace BRC and IFS by ISO 22000 more easily.

One international standard is also a guarantee for our customers – if we all use the same standard, we have the same language, the same methodology, the same assurance systems and the same food safety arrangements. •



International dimension of ISO 22000 motivates Malta's leading food processor



Magro Brothers, Malta's leading food manufacturer and first ISO 22000 certificate holder explains its journey from ISO 9001, via the BRC food industry standard to the international ISO 22000 standard in its quest for continual improvement of its food safety processes.



by Chris Magro

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In December 2007, the food safety management system implemented by the leading food manufacturer in Malta, Magro Brothers (Foods) Ltd., was successfully audited against the ISO 22000:2005 and the company subsequently received the country's first ISO 22000 certificate.

The firm was founded in 1916 by three Magro brothers. In 1934, they ventured into the manufacturing sector as processors of fresh tomatoes. Today, the companies within the group are still family-owned private

companies, and processing of tomato-based products is still the core business.

ISO 22000 incorporates the ISO 9001 and HACCP systems into one standard

The Magro Brothers Group Of Companies has developed into a leading food-processing and manufacturing organization producing an extensive range of canned and bottled food products in consumer sizes under the brand names

of Mayor, Three Hills, Pomi D'Oro, American Style and Savina. Magro Brothers also produce a range of semi-finished products for the catering and confectionery trades.

The companies also undertake contract packing for leading distributors, both local and foreign, and the companies' flexible production structures allow for customized short run contracts.

In 1995, Magro Brothers moved their manufacturing activities to a new, purpose-built factory at Xewkija

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on the sister island of Gozo, with a total covered area of 27000 m². Today, this site has become a centre of excellence for food processing in the Mediterranean.

The companies employ around 150 people. Strict hygiene and quality controls are maintained during the whole production process by qualified personnel, and the companies follow rigidly the Hazard Analysis Critical Control Point (HACCP) system to ensure food safety.

First certifications

Between 2000 and 2007, the companies' quality management system was certified to ISO 9001:2000 by the British Standards Institution (BSI). Meanwhile, in December, 1999, the companies had already been successfully inspected by Procheck Food Safety against the British Retail Consortium Technical Standard (Foundation Level), hence becoming the first Maltese organization having BRC certification.

Since December 2000, the companies are regularly inspected by National Britannia Certification against the BRC at Higher Level, upgraded to Global Standard – Food in 2005 and attaining a Grade A certificate.

In May, 2004, the companies gained the ASDA award for 'The Best New Production Facility 2003'. In 2007, the companies achieved certification to the EU Regulation for Organic Agricultural Products (processing).



Presently, Magro Brothers (Foods) Ltd. exports tomato ketchup, table sauces, pasta sauces and dessert products to various countries within the European Union and North Africa.

Choice of ISO 22000

With top management totally committed to the development and continual improvement of the effectiveness of our food safety management system, which is fully supported by the business objectives of the company and indeed is the main strategy for sustainable growth, it was decided in 2007 to implement ISO 22000.

The fact that our certification body meanwhile was no longer able to audit us for both ISO 9001 and HACCP as in previous years also favoured our decision, since this had led to us undergoing two separate audits by different auditors. It was evident that this situation was not feasible – neither economically nor logistically.

ISO 22000 incorporates the ISO 9001 and HACCP systems into one standard, therefore it became the natural way forward. The fact that our company had already been certified against the BRC standard for the past eight years was not deemed as conflicting, but rather that these two food safety

standards would run concurrently and be complementary to one another, as indeed it turned out to be.

As with ISO 9001, HACCP and BRC, the Magro Brothers food safety and quality team, together with our quality consultant, scrutinized the ISO 22000 standard and established which internal procedures and processes needed fine tuning to be aligned with its requirements.

We did not encounter any great difficulties to customize the standard's generic requirements

An action plan with time frames was determined and targets set for completion of initial audit by the end of November 2007. The action plan mainly included:

- determining the certification body
- updating of the food safety and quality policy
- updating of food safety and quality assurance manual
- alignment of quality procedures and other documentation
- assessment of the planning and realization of safe products
- review of HACCP plans
- validation and verification of the food safety management system

The action plan was completed, targets achieved, and both stages of the initial audit were successfully conducted by Moody International Certification



over a six-day audit in November 2007.

From our experience, we can say that we did not encounter any great difficulties to customize the standard's food safety generic requirements to our specific needs. In truth, this must be attributed not only to top management, the food safety team and other personnel directly having an impact on food safety, but rather to the entire staff within the organization whose relentless efforts and teamwork made it all possible.

ISO 22000 benefits

The first benefit derived from the ISO 22000 is that its requirements for food safety management systems surpass our previous combination of ISO 9001 and HACCP. The compa-

ny spares no efforts towards its end consumers in maintaining its supreme goal of food safety, prioritized and entrenched in our food safety and quality policy.

Moreover, being an international standard, it may provide our company with potential customers who would require us to be certified specifically against this standard. Our exposure on the list of ISO 22000 certificate holders also aids us towards this end.

Undoubtedly, another benefit is the requirement for setting up of an emergency preparedness and response team to manage potential emergency situations and accidents that can impact food safety.

The company aims to continuously and strictly adhere to our



two parallel-running food safety standards, in order to maintain and strengthen our vision "as a centre of excellence and the leading food processor in Malta and a recognized operator in the food industry worldwide."

The processing of tomato-based food products is the company's core business.

The company spares no efforts in maintaining its supreme goal of food safety.





Market **feedback** on ISO 22000

Two-and-a-half years after the launching of ISO 22000, this article provides an overview on how the standard is faring, reporting on the attitudes of the major stakeholders, as well as feedback from users.*

* Sources: ISO Management Systems, March-April 2006; Food Engineering & Ingredients, May 2006; New Food, 4/2006.



by Jacob Færgemand

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He also serves as convenor of ISO/TC 34, Food products, WG 8, Food safety management systems.

See also "The ISO 22000 series – global standards for safe food supply chains" in this issue.



Chr. Hansen A/S has implemented ISO 22000 at several sites around the world. As a producer of food ingredients, safety is a top priority. Around 500 million consumers eat the products of the company each day.

(Photo courtesy of Chr. Hansen A/S)



ISO 22000:2005 creates a platform for the implementation of a tailor-made food safety management system at minimum cost, helping industry players to implement the proper control measures required to ensure an acceptable level of food safety.

ISO 22000 also creates maximum trust for retailers – although this still needs to be validated, as some retail organizations have not yet adopted ISO 22000. Food safety authorities are exhibiting confidence in the standard, with several European Union member states implementing systems over the last six months enabling them to reduce the frequency of control inspections when a food manufacturer achieves ISO 22000 certification.

Food safety authorities are exhibiting confidence in the standard

Experience shows that a system built by the food manufacturers themselves within objectives specified by the authorities and customers is more firmly grounded in the organization – and thereby much more effective – than pre-defined systems implemented by directive.

A tailor-made system focussed on the risks faced by a particular company will be better integrated with the company's day-to-day work. And when employees understand the meaning of the system, implementation is smoother and costs lower.



The aim of the the global food safety standard ISO 22000 is to let large and small consumers alike concentrate on the joy of food.

Effectiveness through communication

Creating one system to serve various corporate branches and crossing international borders strengthens food safety by harmonizing working procedures. The effectiveness of a system is improved by common methodology and terminology. Another strong

argument in favour of ISO 22000 is the ability to link to other standards, especially ISO 9001 (quality management) and ISO 14001 (environmental management).

A cornerstone of ISO 22000 is that it is a tool for continual improvement and not meant to be hidden away in a laboratory after implementation. The standard includes a strong focus on communication and it is intended to allow documentation of a well-established food safety system to create confi-

dence among clients, authorities and suppliers.

With effective communication, the major food safety challenges are understood where they are most important: on the production floor. The enhanced internal and external communication inherent in ISO 22000 results in risk reduction, and a global standard provides a common vocabulary and avoids costly and risky misunderstandings.

SPECIAL REPORT



Challenges to come

Two and a half years after the launch of ISO 22000, other food safety standards have not been abandoned. But producers throughout the food chain have accepted and implemented ISO 22000 as a new global food safety standard.

Still, many small and medium-sized companies are waiting for actions by the three main market drivers: the major multinational food companies, public authorities and retailers.

Some of the multinational food companies in Europe have been very positive about implementing the standard for themselves and their suppliers. Authorities in some countries

Good for customers and suppliers

"To have a common global standard and a shared point of reference is an advantage for customer and supplier alike. At the same time we found the content of ISO 22000 more balanced than any of the existing private retail standards, so it was better fitted for our company.

"Finally, it was fairly easy to incorporate this rather comprehensive standard into our existing ISO 9001 system."

Lasse Ahm
Environment and Quality
Manager
Panther Plast

ISO 22000 "raises the bar"

"After extensively reviewing existing standards and the new ISO 22000, we were convinced that this new standard would help us 'raise the bar' to an even higher level.

"The benefits of ISO 22000 are that it audits and verifies our food safety management system according to HACCP principles, and that it integrates food safety management with our ISO 9001:2000 quality management system.

"We have combined ISO 22000 with our own internal standards and this has not only provided a robust guideline for our food safety management system, but it has also allowed us to promote a culture of continual improvement in our manufacturing practices."

Alan Richards
Production Director
The Wrigley Company

have plans to allow certified companies to benefit through less frequent controls and possibly to outsource public control.

The driving forces for the future development of the standard are to a large extent the retailers, the big food producers and national authorities. Dialogue among these actors is needed to answer the question of how and when an environment with one solid, well-implemented food safety system can be created.

The authorities must define acceptable levels for different areas such as salmonella, coli bacteria and campylobacter, and the companies have to incorporate control measures to ensure that these hazards are kept to specified levels.

Another challenge is to develop a structure of well-described prerequisite programme guidelines that ISO 22000-certified companies must implement. If certification bodies, together with accreditation bodies, can find a way to report the output from the certification audit, then retail organizations would be more likely to reconsider acceptance of ISO 22000, as their due diligence and risk minimization would be supported. This work is in progress in the technical committee of the Global Food Safety Initiative (GFSI). •

"We keep improving"

"With ISO 22000, we are on the forefront of developments within the food safety area. Certification ensures us that the standard is well implemented, and that we keep improving ourselves."

Niels Juul Mortensen
Quality Manager
Central Quality Department
Arla Foods amla



Eight keys to successful ISO 22000 implementation

Outlining eight practical steps to successful ISO 22000:2005 implementation, the author likens continual improvement in food safety to mountain climbing, where progress is made via a series of intermediate successes, and to running a race where the hurdles become ever higher!



by **Olivier Boutou**

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You may well ask whether ISO 22000:2005, *Food safety management systems — Requirements for any organization in the food chain*, is appropriate for your organization. Many leading food industry companies have already made the affirmative decision.

ISO 22000:2005 is a management system standard. According to ISO/IEC Guide 2, *Standardization and related activities – General vocabulary*, a standard is a document established by consensus and approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.

In this case, ISO 22000:2005 specifies requirements for a food safety management system (FSMS) where an organization in the food chain needs



to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. ISO 22000 is rapidly becoming the first globally recognized standard for food safety.

To implement this standard, we suggest adopting a step-by-step approach, working at your own

pace and making accuracy your ally. This is precisely the aim of continual improvement. To succeed, a programme of change must advance via a series of intermediate successes. Like mountain climbing, it is necessary to stop at base camps along the way.

SPECIAL REPORT

Practical steps forward

The logic behind management standards such as ISO 9001, ISO 14001 or ISO 22000 is to establish a series of actions to be implemented prior to building your system. These actions are the direct responsibility of management, and include:

- an initial analysis of customer needs, expectations and requirements;
- identification (or confirmation) of regulatory requirements;
- definition of a policy supported by measurable objectives.
- planning of actions and resources needed to meet your objectives.

Once these steps have been accomplished, management should define how it will control FSMS improvement. This is the “management system” phase, including:

- analysis of the individual results obtained;
- evaluation of combined results;
- formulation of recommendations for improvement.

On the basis of these findings, we propose a method of building a certifiable ISO 22000:2005-based system based on eight keys to success (see **Figure 1**).

To view this in a dynamic way, imagine competing in a long-distance running race over

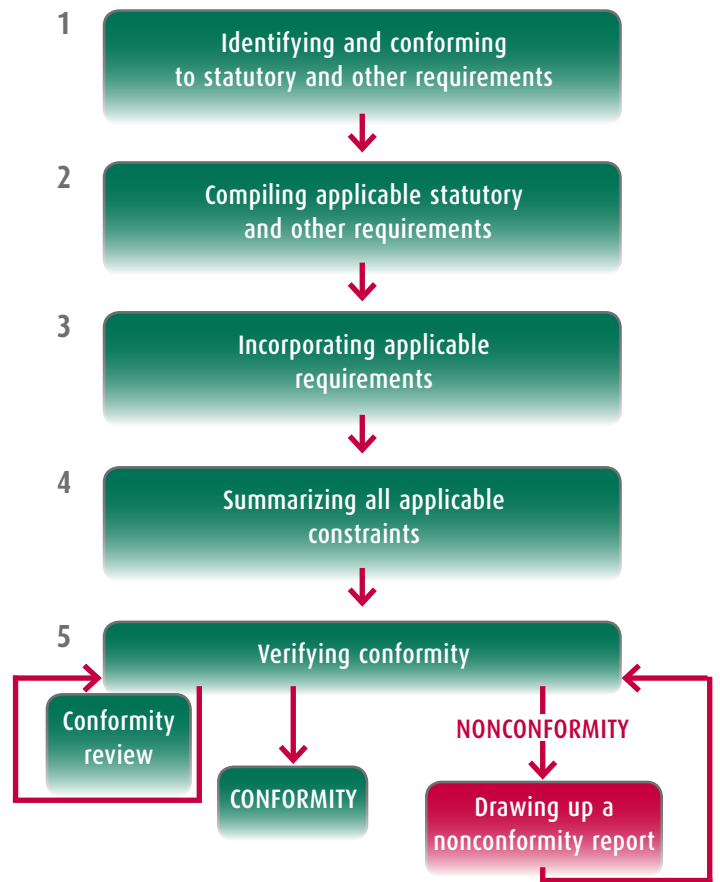


Figure 2 - Example of a critical path to regulatory observance.

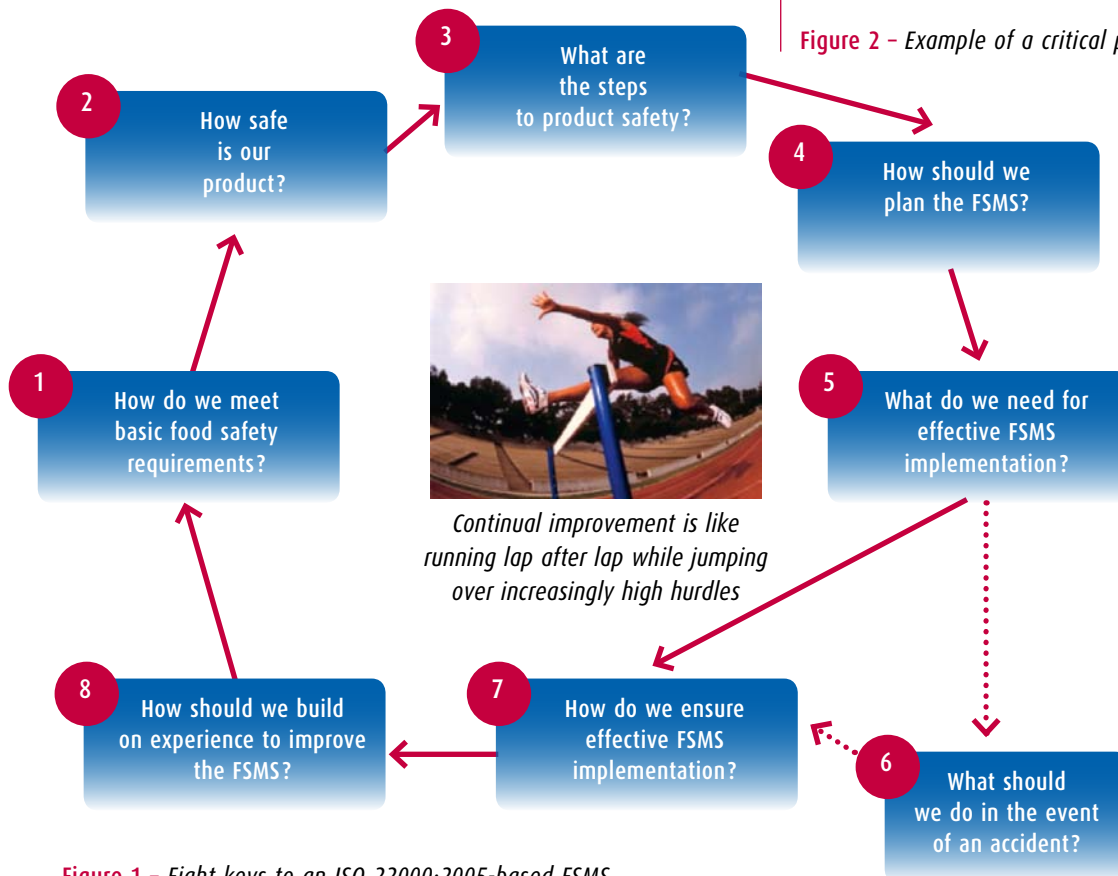


Figure 1 - Eight keys to an ISO 22000:2005-based FSMS.

hurdles. The interested parties, stakeholders in our FSMS, will be our supporters. They will keep a close watch on how we perform and will certainly encourage us to do better.

1st key element

How do we meet basic food safety requirements?

This is the starting signal and determines how your regulatory observance programme should be conducted (see **Figure 2**). It also provides the opportunity to see how your food safety team defines, approves, communicates, implements and monitors the prerequisite programmes (PRP).



The general principles of food hygiene establish solid foundations which, if necessary, should be used jointly with guides to good hygiene practice. These principles apply to the entire food chain from primary production to consumption, and specify the hygiene controls that must be carried out at each stage. Therefore, this first key element addresses the review and diagnosis of such food safe-

ISO 22000 is rapidly becoming the first globally recognized standard for food safety

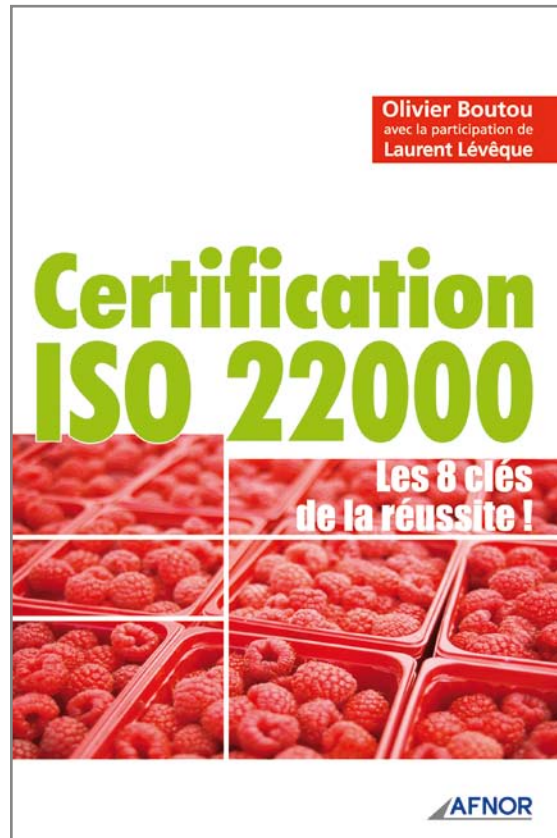
ty requirements.

Purpose of 1st key element

The ultimate purpose here is to identify all the basic conditions and activities necessary to maintain, on a permanent basis, a hygienic environment during the production, handling, storage and provision of safe food or end-products for human consumption.

Basic entry data to help develop these PRPs can include:

- Codes of Practice of the Codex Alimentarius (www.codexalimentarius.net);
- applicable and statutory requirements;
- good hygiene practice guides;
- contractual requirements with customers;
- trade practices and customs.



The organization must:

- identify the PRPs to be observed;
- implement PRPs effectively;
- ensure the permanent implementation of its PRPs.

Management should be able to develop, formalize and communicate its policy to all interested stakeholders, based on this analysis.

2nd key



How safe is our product?

ISO 22000:2005 requires that the organization use a dynamic and systematic approach to developing a FSMS, by

- implementing and monitoring planned activities, maintaining and verifying effective control measures;
- updating information; and
- taking appropriate action in the event of nonconformities.

These guidelines can be found in the HACCP (Hazard Analysis and Critical Control Point) plan section of the standard. However, the organization should first address the steps preceding hazard analysis by:

- assembling an HACCP team with multidisciplinary skills;
- producing a product description;

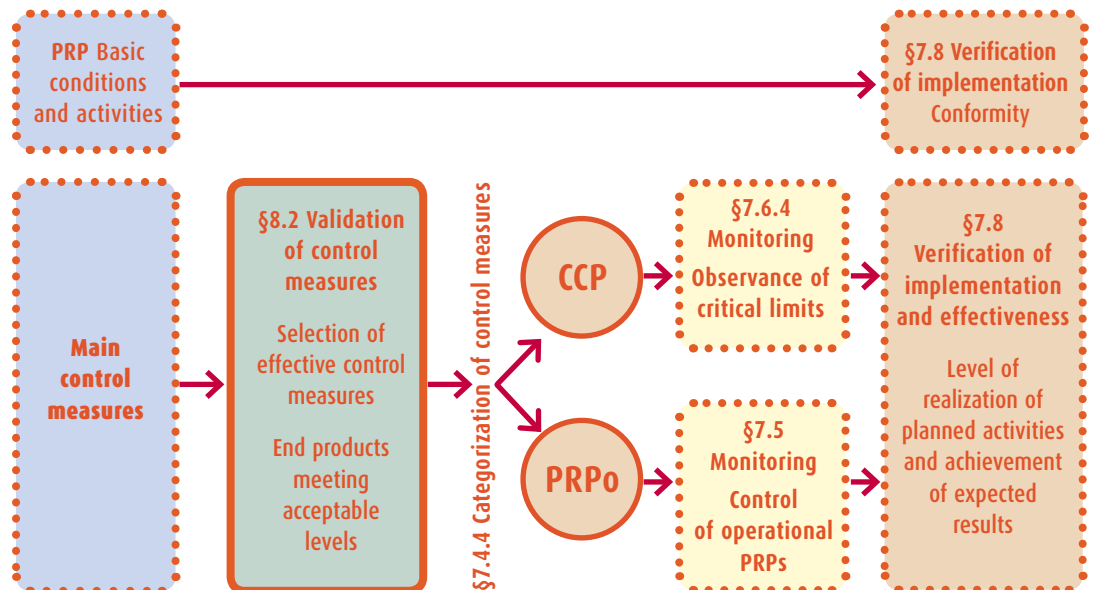


Figure 3 - Validation, monitoring and verification of an essential control measure.

SPECIAL REPORT



- defining the intended product use;
- drawing up a flow diagram and on-site confirmation.

and then proceed with the following steps:

- hazard identification and assessment (biological, physical or chemical);
- selection and assessment of control measures to be aligned with a CCP (Critical Control Point) and/or an operational PRP;
- establishing and managing an HACCP plan and/or operational PRPs.

ISO 22000
requires a dynamic
and systematic
approach

Purpose of 2nd key element

Clause 7 of ISO 22000:2005 addresses the phases of safe product planning and realization (HACCP method), while Clause 8 deals with the phases of verification and action. System maintenance and improvement are addressed throughout the planning, validation, monitoring, verification and updating cycles (see **Figure 3**). This step-by-step key will then enable the organization to efficiently implement and/or review its HACCP plan by incorporating the new ISO 22000:2005 concepts.

3rd key



What are the steps to product safety?

Your top management should define its overall intentions and direction in food safety, to enable measurable food safety objectives to be established.

Establishing a safety policy requires the full commitment of all, starting with a management strongly committed to:

- mobilizing personnel so they feel involved and willing to comply with instructions;
- encouraging the achievement of objectives;
- creating favourable conditions for team work;
- communicating to personnel the importance of its ISO 22000:2005-based project, and raising awareness of food safety.

Evidence of management commitment can be seen from awareness and leadership initiatives (attendance at meetings, training sessions, investment plans, etc.) intended to help develop and implement the FSMS.

Purpose of 3rd key element

The food safety policy should normally be consistent with the organization's overall policy, and provides a framework for setting objectives. ISO 22000:2005 requires that an organization analyze its position in the food chain to assess the degree of upstream and downstream control, and adjust its policy accordingly.

Management should analyze:

- its main customer/regulatory and statutory requirements (see 1st key element);
- its main organizational weaknesses regarding food safety;
- the main environmental changes necessary.

Management should be able to develop, formalize and communicate its policy to all interested stakeholders, based on this analysis.

4th key



How should we plan the FSMS?

To achieve the objectives and ensure end-product safety, the process of system planning will require responses to the following questions:

- What do we need to do and how? In what order? Within what deadlines?
- Who is responsible? Who are the authorities?
- How should we build the documentation system?
- What physical and human resources should be deployed?
- How should we measure the work in progress?

Purpose of 4th key element

Means should be matched to objectives. It is particularly important to structure the various actions and resources (notably budget) in accordance with a schedule. Good forward planning enables your organi-

zation to anticipate and handle any eventualities, while controlling impacts on food safety.

5th key



What do we need for effective FSMS implementation?

Controlling food safety through an HACCP plan inevitably implies using technical resources and appropriate operational activities. At this stage, the HACCP plan should be well established. The means and activities that will make it function properly should now be identified.

Such identification can include regulatory provisions – e.g., food traceability – and consensus-based or voluntary provisions, such as control of non-conformities and metrology of measuring equipment. Of course, each manufacturer is free to add any other means or activities it deems necessary or appropriate to those that have already been determined.

Top management
should define its overall
intentions and direction
in food safety

Purpose of 5th key element

This key element addresses the implementation of an effective traceability system, supplemented by measuring, calibration and monitoring equipment to ensure that nonconformities do not occur.

Emergency situations	Actions taken
Technical problem	
Temperature increase in cold room	Inform the HACCP-responsible person and plant manager Repairs Transfer to another cold room Reinforce product control Assess outcome/condition of the products involved by the HACCP-responsible person
Water: pressure drop or stoppage	Inform plant manager Limit water use to vital plant functions only
Power cut	Inform plant manager Start generators to meet key power requirements
Critical level of energy supplies	Inform plant manager Establish emergency level to maintain essential activities before delivery of new energy supplies
Drop in compressed air supply	Inform plant manager Repairs Deploy mobile compressors
Fire	Deploy available fire-fighting facilities Inform plant manager Isolate products likely to be contaminated by fire extinguisher chemicals

Figure 4 - Example of nonconformity control procedure.

6th key 

What should we do in the event of an accident?

Unfortunately, accidents can happen in the food-processing industry. Your company must have a system in place to respond to emergency situations, such as food safety alerts, outbreaks of food poisoning, process malfunctions, equipment failures, product withdrawals and recalls.

Purpose of 6th key element

It is essential to be in a position to handle all emergencies in the organization and avoid the internal or external impacts of such nonconformities (see **Figure 4**).

7th key 

How do we ensure effective FSMS implementation?

This element highlights verification of your FSMS effectiveness, and is covered in step 11 of the HACCP plan: Establish verification procedures. It requires your verification activities to be planned to ensure that the actions taken have been implemented and are effective.

Purpose of 7th key element

The verification process creates confidence that the FSMS you have implemented has been properly evaluated and is relevant. The organization must provide evidence of FSMS

effectiveness in terms of the level to which planned activities have been realized, and the extent to which expected results have been achieved.

8th key 

How should we build on experience to improve the FSMS?

This is the continual improvement loop of the system. Such improvement is possible only after the analysis of data. You should take account of the results of verification activities before making decisions during the management review. This review should enable you to identify new resource needs, generate improvement actions and decide on the appropriateness of your policy.

Purpose of 8th key element

To achieve optimal food quality and safety, organizations must adopt a continual improvement approach, i.e., involve all parties in a daily quest for effectiveness. This key element determines the requirements that must be fulfilled to establish a truly dynamic system.

To conclude the athletics analogy, successful ISO 22000:2005-based FSMS implementation requires continual effort lap after lap. Indeed, the pursuit of continual improvement, particularly in food safety, demands that you jump over increasingly higher hurdles!

