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QUALITY IN THE AGRO-FOOD SECTOR
State of the art and evolutionary trends
in Europe

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Quality of food

- Quality of food products – as ability of satisfying the needs of consumers – is the combination of a number of factors, such as:
 - hygiene and healthiness (food safety);
 - organoleptic and nutritional characteristics (taste, odour, aroma, colour, nutritional components);
 - elements of utilization (preservation, usability, type of packaging);
 - cultural factors (tradition, local origin, genuineness);
 - ethical factors (e.g. preservation of the eco-system, flora and fauna, including animal well being).

Quality of food

- To achieve and ensure quality of food products, it is necessary:
 - to define the requirements related to the satisfaction of quality needs in form of appropriate normative references, both mandatory and voluntary (**standardization**);
 - to assess and attest compliance with requirements (**certification of conformity**), under the aegis of an independent and competent authority (“**accreditation**” by Public Regulators and/or authoritative Accreditation Bodies).
- **Food safety** is the **basic requirement** that must always be fulfilled, being as such a pre-competitive factor for the food operators.

Short introductory outline of European Accreditation

- Accreditation in Europe is regulated by **Regulation EC 765/2008** setting out requirements for accreditation and market surveillance. It applies to accreditation of all conformity assessment activities in both voluntary and regulated spheres (no principle exclusions).
- Main **general principles** are:
 - One national Accreditation Body (AB) per Member State duly recognized and empowered by the Government;
 - ABs act with public authority in the public interest;
 - ABs shall be independent of commercial motivations, being not-for-profit organizations;
 - ABs shall not be involved in conformity assessment and consultancy activities;
 - Member States shall ensure that the national ABs have appropriate resources;
 - National ABs shall be members of EA and signatories to the EA MLA;
 - ABs shall enable effective and balanced participation of all interested parties;
 - Being accreditation as above the preferred way, Member States, not resorting to accreditation in their authorization processes, shall provide evidence of the equivalence of the procedures used;
 - Operational requirements for ABs are well aligned with ISO/IEC 17011 with some additional requisites (e.g., in addition to the above, strict limitation to operation of cross-frontier accreditation).

European standardization and certification in the food sector – Mandatory field

- The European legislation on hygienic-sanitary quality of food products (food safety) includes, among others:
 - Green Book on “*General principles of food legislation in the European Union*” (1997);
 - Green Book on “*Quality of agricultural products*” (product standards, production requirements, certifications systems) (2008);
 - White Book on “*Food safety*” (2000);
 - EC Regulation 1760/2000 “*Labelling of meats*”;
 - EC Regulation 178/2002 “*General food law*”;
 - Set of EC Regulations of the so called “*Hygiene package*” (2004) covering: hygiene of food products – generals; specific norms for hygiene of food product of animal origin; official controls on food products of animal origin for human consumption; official controls on animal feed;
 - EC Regulation 479/2008 on “*Organisation of the common wine market*”;
 - EC Regulation 1441/2007 dealing with “*Search for pathogens*”;
- This legislative framework constitutes an effective tool for the harmonization of policies and procedures on food safety and related controls in Europe.

European standardization and certification in the food sector – Mandatory field

- Official controls of the observance of the above rules fall within the area of “mandatory” conformity assessment and are in care of the competent national Authorities who may delegate specific tasks to competent third party conformity assessment bodies (CABs).
- In most cases, presumption of competence is represented by accreditation granted by a recognized authoritative Accreditation Body (as the ABs signatories to the EA MLA) according to ISO/IEC 17025 or ISO/IEC 17020 or ISO/IEC 65 or ISO/IEC 17021, depending on the type of assessment involved (tests, analyses, inspection, product certification, management system certification).

European standardization and certification in the food sector – Regulated field

- The particular needs of the consumers for typical features of food products, related to local traditions and cultures, are addressed by the following Regulations:
 - EC Regulation 509/2006 on *“Agricultural products and foodstuffs as traditional specialities guaranteed”*;
 - EC Regulation 510/2006 on *“Protection of geographical indications and designation of origin for agricultural products and foodstuffs”*.
- To the demands for genuineness and protection of the environment, the European legislator answered by the establishment of the:
 - EC Regulation 834/2007 on *“Organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs”*.

European standardization and certification in the food sector – Regulated field

- Compliance with the above Regulations – leading to the issuance of “**regulated quality marks**” – is a voluntary choice of the producers who have to conform their production to the applicable requirements and submit to the related controls, as defined by the legislation.
- Conformity assessment activities (control activities) are performed by CABs (Control Bodies) operating according to ISO/IEC Guide 65 (EN 45011) (presently under revision) authorized by the competent National Authorities.
- In most of the member States, accreditation (EA MLA or equivalent) has been a pre-requisite for such authorization. Accreditation is now mandatory from 2010 on, following the issuance of Regulation EC 765/2008 establishing the European accreditation system (unless the competent Authorities demonstrate the equivalence of their assessment process).

European standardization and certification in the food sector – Voluntary field

- Mandatory food safety fulfils the essential needs of the consumers and regulated quality marks satisfy other important social and cultural requirements of the society.
- Producer's and consumer's requirements may however concern other characteristics which are not necessarily covered by the mandatory legislation and regulatory provisions.
- Additional elements are thus necessary to enable producers to deliver appropriate quality and consumers to make the best choices according to their needs and wishes. Such elements may be addressed by both product and system voluntary quality approaches.

Voluntary field

Product approach to food quality

- It is represented by “**voluntary food quality marks**” which attest conformity to distinct quality requirements including, as well, food safety and other social aspects.
- Quality features are defined by suitable normative references (*Technical Standards, Specifications and “Disciplinarians”*) issued by Standardization Bodies or by other competent subjects with the consensus of the interested parties.
- A variety of voluntary normative references have been developed and are being used in Europe also with regard to food safety, as complementary and integrative to the pertinent legislation, such as the standards BRC, IFS, SQF, EUREPGAP and others.
- Some of these systems do really introduce and assure additional quality features; some others do only guarantee the compliance with mandatory requirements but may have additional value insofar they develop the minimum legal requirements, introducing more detailed and controlled operational approaches.

Voluntary field

Product approach to food quality

- Voluntary standards have also been issued concerning requirements on “**Traceability**”, both along the entire “*Food chain*” (food chain: ensemble of the operators/operations concurring to the formation, distribution, commercialisation and delivery of food products) and inside a single organization of the chain.
- Conformity with the requirements of the above voluntary normative documents is assessed within “product certification” schemes, operated by accredited CABs, more or less complex depending on the type of product and characteristics to be evaluated.
- Assessment procedures may be typical of conventional product certification or be more a kind of process certification or a combination of process and management system certification. Tests and analyses are, anyhow, essential components of the schemes.

Voluntary field

Product approach to food quality

- Examples of food product categories covered by accredited voluntary product certification (voluntary quality marks) in Europe include:
 - Retailers and suppliers standards
 - vegetable and fruit products (scheme EUREPGAP);
 - transformed food products (schemes BRC, IFS, SFQ and others);
 - Private disciplinarians
 - Cereals;
 - Bakery;
 - Jams, conserves, fruit homogenised and juices;
 - Eggs, milk and milk derivatives;
 - Frozen vegetable products;
 - Bovine, pork and bird meats and related processing products;
 - Chocolate products;
 - Olive oils and other oils;
 - Non GMO products.
- Examples of food chains with certified traceability are:
 - Vegetables and fruits (from seeds to packaging);
 - Bovine and pork meat (from the purchase or birth of the animal to the distribution point);
 - Milk (from breeding to the distribution point).

Voluntary field

Product approach to food quality

- Still in matter of product approach to food quality and with special reference to the protection of the environment – which represents a must for the creation and maintenance of a sustainable agricultural and agro-industrial system – it is worth mentioning, as well, the so called ***Environmental Product Declaration (EPD)***.
- The EPD is a document – voluntarily prepared by the producer based on ISO 14040 (Life cycle assessment) and ISO TR 14025 (environmental labels and declarations) and verified and validated by a competent third party Body – that provides objective, verifiable and thus credible information on the environmental impact of the product in relation to its entire life cycle.
- To render the Declarations mutually comparable and thus usable by the marketplace, common requirements are established for homogeneous product categories, through preparation and publication of ad hoc “Product Category Rules” (PCR).
- The EPD is communicated to the marketplace through adequate registration and publication mechanisms (similar to those adopted for the EMAS declaration according to the applicable EC Regulation).

Voluntary field

System approach to food quality

Standards ISO 9001 and ISO 14001

- Besides the above more or less direct approaches to food quality, also “indirect” approaches, represented by the implementation and certification of suitable *management systems*, have found considerable diffusion in Europe.
- These have traditionally concerned *quality management systems* – QMS (ISO 9001) and *environmental management systems* – EMS (ISO 14001).
- Conformity to the above systemic standards, confirmed by a valid certification, is of considerable help for the agricultural production and food industry to achieve and assure compliance with quality requirements and chiefly food safety.
- In fact – besides promoting the continuous improvement of the performances of the producers in terms of ability of satisfying the customer needs – conformity to ISO 9001 should ensure, at first, the observance of legislation on food safety.
- Likewise, compliance with ISO 14001 should foster the observance of environmental regulations applicable to the organization’s production processes and products.

Voluntary field

System approach to food quality

Standards ISO 9001 and ISO 14001

- In Europe, accredited ISO 9001 certifications in the agro-food sector (EA scopes 01 and 03) are about 5 % of the total number of accredited certifications for all the 39 scopes that are nearly 600.000. Accredited ISO 14001 certifications amount to about 10 % of the total that is nearly 80.000.
- These figures confirm the relatively wide diffusion of the system approaches to food quality, concerning both food safety and other quality features, as well as the environmental aspects.
- The above generic systemic standards, however, do not explicitly address neither the specific issues of food safety nor the peculiar aspects of the environmental impact of the agricultural production and agro-food industry. As for the latter, however, the best solution is represented by the product approach based on the EPD and it is not expected specific EMS standards be developed for the agro-food sector.

Voluntary field

System approach to food quality

The ISO 22000 series

- The need was felt, by the agro-food sector, for specific guidance to the management of processes and resources for assuring hygiene and healthiness of food products and this has led to the issuance of the ISO 22000 series of standards. The series includes various documents. Regarding quality realization and assurance, the main documents are:
 - ISO 22000 *“Food safety management system – requirements for any organization in the food chain”*;
 - ISO TS 22003 *“Food safety management systems – requirements for Bodies providing audit and certification of food safety management systems”*.
- The ISO 22000 standard has been produced with the aim to harmonize the criteria for food safety management, along the entire food chain, in order to overcome the present situation of a multiplicity of voluntary food safety standards creating confusion and causing difficulties to the operators who are forced to comply with similar requirements expressed by different standards with useless duplications.

Voluntary field

System approach to food quality

The ISO 22000 series

- The ISO 22000 standard is intended, as well, to promote a unified approach to the application of the principles of HACCP (Hazard Analysis and Critical Control Points).
- The implementation of ISO 22000 and the related certification of conformity should further enhance the diffusion of the systemic approach to quality in the food sector, to the benefit of producers and consumers.
- The European food sector (and chiefly the food industry) are looking with interest at the ISO 22000 series of standards and ad hoc accredited certification schemes are already in place or are being developed in several European economies.
- Accreditation of CBs operating certification against ISO 22000 is performed based on ISO/IEC 17021, integrated by ISO TS 22003 and EA application guidance.

Quality of food products analyses

Outline of outstanding issues

- These are largely similar to those applying to the generality of tests and measurements.
- There are, however, specific aspects that are worth being considered to improve the quality of testing also through better controls by the accreditation bodies. Examples are.
 - Lack of culture of the agro-food industry; in-house laboratories often conduct the analyses employing non-appropriate methods and, even if valid methods are used, results are not always interpreted in the correct way;
 - Lack of observance of rules; existing requirements for analytical and sampling methods are not always duly fulfilled, also due to lack of identification of the performances of the method;
 - Difficulties in the validation of the analytical methods (in case of use of non standardized methods);
 - Severe difficulties in estimating the uncertainties associated to the results and in using the related data for assessing compliance with the requirements;

Quality of food products analyses

Outline of outstanding issues

- Cont.
 - Lack of reference materials;
 - Problems with the availability of appropriate sampling procedures and related statistical significance;
 - Criticalities associated to the manipulation of samples;
 - Insufficient or inadequate laboratory “process controls” with risk of lack of identification of non conforming situations that may lead to non valid results;
 - Difficulties in participation in ILCs and problems with the competence of the respective providers.
- The above criticalities may be partly enhanced – or anyhow their solutions is not facilitated – due to lack of effectiveness of the accreditation process. For example, sampling activities are not always properly covered by the accreditation (with related traceability problems and risk of invalidation of the results), as well, often, the competence of the assessors of the AB is not tailored to the specific sectoral characteristics of the analyses under evaluation.

Conclusions

- Effective certification of conformity to appropriate normative references – which is required in all social-economical activities for the creation of confidence – is of paramount importance in the agro-food sector, owing to the primary and diffused character of the needs that the corresponding products are called to satisfy.
- To this purpose, the development of the pertinent regulations and standards is to be promoted and the different forms of conformity assessment (testing, inspection, product, process and system certification) must be duly exploited as mutually correlated and complementary.
- The credibility of the conformity assessment activities must be ensured by effective and rigorous controls performed by the competent Public Authorities and/or authoritative ABs.
- Appropriate market surveillance by the Public Authorities is also a must for the consolidation of the quality culture and practice in the agro-food sector.

Conclusions

- The European accreditation and conformity assessment infrastructure – constituted by the national accreditation bodies members of EA and by the accredited conformity assessment bodies – is striving to:
 - value the available mandatory and voluntary tools in a coherent and synergic way;
 - ensure the validity and effectiveness of the conformity assessment procedures and the credibility of the corresponding results;
 - confer to the accredited attestations of conformity the appropriate visibility, through suitable communication and education activities,with the aim to render “certified quality”, in the different and complementary applicable forms, the basic instrument for the fair and effective functioning of the European and global market of food.