# The importance of collective provision of food safety and data security in the digital age

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When food product is purchased, consumers want to be sure that it is suitable for human consumption and safely produced in good quality. Food must be produced immune from any physical, chemical or biological contaminant and be delivered to end user under cold chain when necessary. Fruits and vegetables, meat, fish and dairy products in the market in the form of frozen or close to freezing point are within this scope. For food safety, temperature limits should not be exceeded during the distribution of food. This is important for quality assurance. Furthermore, condition of product throughout the distribution must be verified for future, and continuously monitored to detect problems.

Temperature is a key parameter in food safety such as, relative humidity and total polar material for dry food and frying oil, respectively. To ensure correct measurement, effecting factors must be predefined. The main factors are: selection of correct measurement instrument, instrument's compliance of the standards, user's training level, and certification of the instruments by accredited calibration laboratories.

The methods in measurement can be classified as random/spot or nonstop/ongoing recordings. The measurement can be done by either mobile or stationary instrument in compliance with standards mentioned above.

As technology advances, measurement instruments and methods evolve towards digital food safety and quality management systems. The main logic behind digital systems are: (1) stationary and user-supported mobile measurement instrument that collects data on site; (2) transferring of these data to intermediate elements (hand terminals, tablets) through communication protocols such as Bluetooth, Wi-Fi and NFC; (3) then, automatic transfer of data to the Cloud or user's server through Wi-Fi or Ethernet; (4) management of quality-related data (digital control lists inhibiting measuring parameters, monitoring cold-frozen areas) from a single center. By these systems, it is possible to ensure data integrity, traceability, to be in compliance with legal standards; to minimize human errors; to establish alarm limits; to end paper waste; and consequently, to minimize food waste and loss.

In addition to standard temperature measurements, instruments so called "spy" can be used during transportation or storage of the food by the owner. In the absence of digital applications, paper print-outs from analogue devices are used to evidence the temperature levels. In case of a problem, this data should be provided to the court as evidence in case of dispute. Unfortunately, most of the time, measurement values are not being submitted to the court. The measurement conditions or accuracy of the measurements provided by analogue instruments can be suspicious. The brand and model number of the measurement instrument, the measurement point, range of measurement and the accuracy of the measurement, and above all, the calibration certificate of the instrument should be submitted to the court together with the data. Then on measurements can be significant; and as a result, can be accurately evaluated by experts.

Even though Cloud-based new technologies provide great convenience in digitalization process, it also brings in new questions: how to provide data security and how to build legal infrastructure on this information?

There are two problems: to prevent data loss and to protect data from access of third parties.

The server of the Cloud must be certified and in compliance to national and international standards (PCI DSS, ISO 27001 and 95/46/EC). Even the server/Cloud provider has no access to data. It is unknown how these digital data stored in Cloud can be used as legal evidence. Herein, traceability and safety of data stored on a digital platform and its usage by courts for determination of responsible part in case of any dispute are discussed.

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