



JOINT FAO/WHO FOOD STANDARDS PROGRAMME

**CODEX COMMITTEE ON FOOD IMPORT AND EXPORT INSPECTION AND CERTIFICATION
SYSTEMS**

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PROPOSALS FOR NEW WORK RELATED TO THE EMERGING GLOBAL ISSUES

PART 2: DISCUSSION PAPER ON THE DIGITALISATION¹ OF NATIONAL FOOD CONTROL SYSTEMS

(Prepared by Australia, the Netherlands, and the United Kingdom)

Background

1. During the Codex Committee on Food Import and Export Inspection and Certification Systems (CCFICS) Emerging Issues Intersessional Workshop (the workshop), on 21 May 2024, the workshop participants discussed a newly identified emerging issue proposed by Australia regarding the development of principles for the digitalisation of national food control systems (NFCS). The workshop participants agreed this was an important issue and that Australia, working with the Netherlands and the United Kingdom, would develop a discussion paper and potentially a draft new work proposal for consideration and discussion at CCFICS27 (2024).
2. More than 362 registrants including Members, Observers and international organisations participated in the workshop to discuss input on Appendix A of the circular letter (CL 2023/66-FICS).

Discussion

3. There is international recognition that improved productivity, sustainability, and resilience of food systems can be achieved through regulators adopting digital ways of operating².
4. This paper identifies the current challenges facing competent authorities with the lack of available guidance, along with the opportunities, necessities, advantages, and complexities to support further discussion on the need for CCFICS to commence work to develop high-level principles in this area.
5. Food production and trading systems are increasingly becoming more diverse and complex, with vast quantities of information collected along supply chains to provide assurance of food safety and trade related requirements. Collecting reliable and trustworthy data that can be analysed and shared is essential³ for regulatory authorities, and the food businesses involved with food production and processing, food safety, public health, and trade.
6. A key driver for governments and businesses to use digital technologies is to simplify the collection, analysis and sharing of supply chain information and better support data-driven decision making (potentially in real-time). Digital approaches have enormous potential to improve the effectiveness and efficiency of NFCS and ways in which competent authorities regulate and support trade. However, there are no Codex guidelines or principles to assist authorities in their initial consideration of digitalisation of suitable parts of their control system. In the absence of such guidelines or principles, authorities may be overwhelmed by the challenging process they have to navigate when assessing the value of digitalising parts of their control system. Whilst the technology is generally more accessible to more people, the costs are linked to local market conditions and may be driven by the availability of technical expertise and infrastructure. A helpful principle in these circumstances would suggest the need for a cost benefit analysis

¹ The development of processes and the modification of workflows to enhance manual systems

² OECD (2019), Digital Opportunities for Better Agricultural Policies, OECD Publishing, Paris, <https://doi.org/10.1787/571a0812-en>.

³ FAO and WHO (2020), The Future of food safety: Transforming knowledge into action for people, economies and the environment – Transforming knowledge into action for people, economies and the environment. Technical summary by FAO and WHO. Rome. <https://doi.org/10.4060/ca8386en>

to ensure that any proposed use of a digital solution is targeted and fit for purpose. Communication and collaboration between agencies within a country are important factors.

7. In response to increased need for digitalisation, there has been a noticeable shift in interest within the Committee to consider the need for developing digital-related guidance or principles. This is evidenced by the number of digital-related matters being raised in the Committee and the following principles and guidelines that currently exist or are under development/review:
 - a. *Guidelines for Design, Production, Issuance and Use of Generic Official Certificates* (CXG 38-2001)
 - b. *Principles and Guidelines for Monitoring the Performance of National Food Control Systems* (CXG 91-2017)
 - c. *Principles and Guidelines on the Use of Remote Audit and Inspection in Regulatory Frameworks* (CXG 102-2023)
 - d. Proposed draft Guidelines on the Prevention and Control of Food Fraud - under development
 - e. *Principles for Traceability/Product Tracing as a Tool Within a Food Inspection and Certification System* (CXG 60-2006) – under review
 - f. *Principles and Guidelines for the Assessment and use of Voluntary Third-Party Assurance Programmes* (CXG 93-2021)
8. The Committee's interest and work in this space is likely to increase over the next decade.
9. In addition to the guidance mentioned above, there is a significant amount of work that has, or is in the process of being undertaken by other international organisations in the digital trade and data standards space. This requires thorough review and consideration to identify priorities for proper alignment with digitalisation of NFCS or parts thereof. Of note, the International Plant Protection Convention (IPPC) is exploring the use of digital tools to support decisions to prevent plant pest outbreaks⁴. Both IPPC and the World Organization for Animal Health ⁵ (WOAH) have materials on the application of electronic phytosanitary and veterinary certification. Work undertaken by the United Nations Economic Commission for Europe (UNECE), the World Customs Organisation (WCO), the International Organization for Standardization (ISO) and the Organisation for Economic Co-operation and Development (OECD) may also be relevant.
10. A preliminary gap analysis of existing digital-related Codex texts reveals that current guidance references "electronic means" without further elaboration, or where more descriptive guidance is captured, it is specific to parts of the NFCS despite potentially having broader application and value (See **Annex 2**). The existing guidance influences how countries approach the digitalisation of NFCS, often targeting specific components at a time which often results in systems that do not 'talk to each other'. The longer-term aim should be for these components to gradually connect over time.
11. The existing CCFICS texts promote the use, collection and/or exchange of data through standardised/model templates and/or guidance which may include criteria etc. The information and data from these various model templates can be held digitally and as well as being exchanged in a digital format there may be additional value/use as it becomes much easier to extract, combine, interrogate and analyse it. Transitioning to digitally held records and platforms could also lead to commensurate efficiency/productivity gains that contribute to wider NFCS objectives and those of Codex's parent bodies, e.g. food system transformation, as moving data around is easier and less resource intensive than moving people or paper. The data can be stored in one place and accessed from different places.
12. Broader considerations when digitalising a NFCS, could include data standards and integration, security of data, data flow and ownership and transparency, along with a range of regulatory framework and policy positions when designing and implementing digital systems for specific parts is important.
13. The opportunity for CCFICS is to consider the development of principles which capture the high-level considerations for countries in the process of, or looking to start the process of, digitalising parts of their NFCS, and in the case of artificial intelligence (AI) use, assure the responsible and ethical use of the available tools, including those that may be developed in-house. The intended outcome of this work would fall within the terms of reference of CCFICS, as it relates to harmonising methods and procedures which

⁴ IPPC (2023) FAO website [African countries harness scientific advances, digital technology, improve technical capacity to prevent plant pests - International Plant Protection Convention \(ippc.int\)](https://www.ippc.int/)

⁵ WHOA (Unknown) Development of a framework to facilitate e-veterinary certification for international trade on the basis of a single window system [a-veterinary-certification.pdf \(woah.org\)](https://www.woah.org/)

protect the health of consumers, ensure fair practices, and facilitate international trade in food and enhance data exchange.

14. A key benefit of this work would be the creation of a framework under which other Codex digital-related guidance can be organised and connected to relevant international digital standards developed in other multilateral fora. This is to guide the development process for countries by establishing a clear pathway for digitalising their NFCS and encourage broader adoption of digital ways of operating by supporting the prioritisation and development of digital systems capable of sharing data securely. It may also contribute to food security through minimising or reducing trade impediments arising from a widening digital divide, where countries less advanced in adopting digital ways of operating or which have different digital systems, are excluded or unable to fairly participate in international trade. Developing high-level principles will provide a flexible framework that is able to consider the needs of countries regardless of their stage of development and take account of any limitations in infrastructure and skills/capabilities.
15. The framework to organise digital related guidance should be established through the development of overarching principles, as more compartment-specific guidance is developed there is a higher risk of complicating the digital transformation process for countries, as linkages are unclear, and potentially repetitive and conflicting information is generated. This may impact the priority countries place on digitalisation and their success in navigating this process.
16. Although there are clear benefits, the Committee may consider developing such guidance as premature, noting no country has achieved the full digitalisation of a NFCS. The Committee needs to be aware that the digital space is evolving at an increasing rapid rate and avoid that guidance becomes quickly outdated because of detailed technical specifications. These risks may be addressed by ensuring the principles are kept high level and outcome focused, drawing on current experience from the digitalisation of specific NFCS compartments that have universal application.

Recommendation

17. It is proposed that CCFICS leads the development of new high-level principles which capture key considerations that guide countries in the process, or looking to start the process, of digitalising relevant and suitable parts of their national food control systems in a coherent way, as outlined in the Project document in **Annex 1**. This work would also include the review of existing guidance, within Codex and other international organisations, to help build a transparent, connected structure for safer food as well as better food security that encourages and enables interoperability between different systems and platforms.

ANNEX 1

PROJECT DOCUMENT

DEVELOPMENT OF PRINCIPLES FOR THE DIGITALISATION OF NATIONAL FOOD CONTROL SYSTEMS

1. Purpose and scope of the proposed new standard

The purpose of the work is to develop high-level principles that guide authorities in their consideration and application of digital solutions to enhance existing food control systems. A principles-based approach would be light touch and provide the necessary flexibility for members looking at digital solutions as part of their regulatory modernisation programmes and help support and encourage a gradual shift away from manual/physical practices. The work would be broad in scope with the intention that the principles can be applied to any part of a national food control system that may be suitable and benefit from digitalisation and the use of digital tools, including artificial intelligence in a responsible and ethical way.

2. Relevance and timeliness

Regulatory modernisation and continuous improvement are a feature of many control systems as competent authorities strive to improve the effectiveness and efficiency of their NFCS to better protect the health of consumers, food security and facilitate fair trade practices. Digital approaches are viewed by many as an enabler of data-driven decision making, transparency and robust evidence that allows authorities to better target their regulatory resource. The benefits of digitalisation include improved productivity, sustainability, resilience and the potential for real-time monitoring and rapid responses to issues and a step towards food system transformation. Digitalisation is broadly applicable to NFCS, or parts thereof, so work to develop high level principles would be timely to support its application by members.

Countries have identified these benefits and are at the point where they are either in the process of digitalising, or looking to digitalise, parts of their NFCS. Acknowledging this trend, and the enormous task competent authorities face, high-level principles will help guide countries refine and choose an approach that is tailored to their national settings and capacity, drawing on existing experiences that will help strengthen collaboration to overcome common challenges.

There is strong interest within the Committee to take a first step and begin by developing digital-related guidance in the form of high-level principles that would support some of the existing CCFICS texts, or those under development, noting the number of digital-related issues identified on the most recent emerging issues list (Appendix A, CX/FICS 24/27/9). Given this, it is also timely to prioritise the development of a framework within CCFICS which connects and organises this work across Codex Alimentarius committees and is coherent with work underway in other international organisations.

3. The main aspects to be covered

The work would result in the development of high-level principles to guide and support competent authorities in the consideration and uptake of digital solutions that could help transform and modernise their NFCS, or parts of these systems. The principles would capture key universal considerations for competent authorities, providing an overarching framework. The principles would serve as a foundation for future work and proposals for specific digital-related guidance that would need to be considered on a case-by-case basis when submitted.

The principles would be designed to acknowledge and draw from existing digital-related international standards and guidance that contain relevant information to the digitalisation of NFCS. This approach will ensure the future work of Codex Alimentarius in the digital space is connected, aligned and coherent with the work underway in other multilateral fora.

Noting the need for digital transformation processes to be user-driven, the principles will also capture and take account of available high level digital guidance specific to NFCS. Such principles have not been developed within the Codex Alimentarius or other food safety related multilateral fora. The guidance would be sufficiently flexible for different countries and systems at varying stages of development to assist competent authorities navigate the digital transformation process, for example directing authorities to consider cost/benefits.

The principles would include relevant definitions including existing digital-related definitions developed in other Codex texts and multilateral organisations. Similarly, they would reference the use of data standards to encourage and enable the ability to share data both within their NFCS and with trading partners.

The principles would be high-level and provide the necessary flexibility to authorities applying them to their national settings and capacity. They would also not include specific guidance on available technologies

applicable to a specific component or part of the NFCS. Should specific guidance be required, it would likely first be captured as an emerging issue for potential new work using the high-level principles as a foundation.

4. Assessment against the *Criteria for the Establishment of Work Priorities*

a) *Diversification of national legislations and apparent resultant or potential impediments to international trade.*

In general, currently national legislations are being reviewed and/or amended to better consider how governments can facilitate the adoption of digital tools and technologies in the agriculture and food sectors.

This is occurring as policymakers consider the potential opportunities, costs, and risks of digital transformation, and it is likely that this trend will accelerate. Additional guidance developed by Codex Alimentarius might encourage and assist countries through this process to support the transition away from manual/physical and paper-based practices in food safety regulation. It may also assist avoid trade impediments arising from a widening digital divide, where countries less advanced in adopting digital ways of operating, or which have different digital systems, are excluded or unable to fairly participate in international trade.

b) *Scope of work and establishment of priorities between the various sections of the work.*

Development of an overarching framework for CCFICS, supported by high level principles which capture the key considerations for competent authorities considering, or in the process of digitalisation NFCS, would be the priority. This work would draw together common principles of digitalisation across different aspects of the NFCS, connect existing and future digital-related CCFICS work and ensure assimilation with the work of other international organizations. A critical component of this work will be to identify existing digital guidance that may have an application and relevance to the digitalisation of NFCS *whether from the food sector or others*.

Identifying and/or establishing definitions to assist consistency in interpretation and implementation of requirements for the digitisation of NFCS would be a secondary priority, as many of these definitions likely already exist.

Once the principles are completed, the review of existing CCFICS guidance would be conducted to remove repeated information and reference the principles to provide a transparent structure in which Codex texts would be required.

c) *Work already undertaken by other international organizations in this field and/or suggested by the relevant international intergovernmental body(ies).*

Specific principles on the digitalisation of NFCS has not been developed, nor are they under development by other international organisations. This topic is of significant interest, with many international bodies, such as the World Health Organisation (WHO) and Food and Agricultural Organization (FAO), bringing countries together to discuss food safety and trade digitalisation topics and develop issue scanning reports and case studies to raise awareness of the challenges and opportunities it presents. Key insights and findings from these information gathering activities will be considered when developing the principles.

There is a significant amount of work that has, or is in the process of being undertaken, by international organisations in the digital related space, which may be applicable but not necessarily specific to the digitalisation of NFCS and food safety. Of note, the International Plant Protection Convention (IPPC) is exploring the use of digital tools to support decisions to prevent plant pest outbreaks. Both IPPC and the World Organization for Animal Health (WOAH) have guidance of the application of electronic phytosanitary and veterinary certification. Further the work undertaken by the United Nations Economic Commission for Europe (UNECE), the World Customs Organisation (WCO), the International Organization for Standardization (ISO) and the OECD, requires thorough review and consideration to identify linkages to the digitisation of NFCS. This review is included as a specific aspect of the scope of new work.

d) *Amenability of the subject of the proposal to standardization.*

Digitalisation is highly suitable for standardisation. The proponents believe that principles can be developed to address the issues identified in this proposal for new work.

e) *Consideration of the global magnitude of the problem or issue.*

For countries to invest in the digitalisation of NFCS, clear, structured guidance within Codex Alimentarius that connects and aligns with guidance in other trade related international organisations is extremely important. This would simplify the development pathway for countries in the process of, or considering digitalising their NFCS, encourage greater adoption of digital solutions and assist with avoiding the emergence of impediments to international trade as a result of digital divide.

5. Relevance to the Codex strategic objectives

The digital transformation of NFCS is a current issue within the food safety regulation and enforcement space. Developing principles would align with the Codex Alimentarius' strategic goal 1: Address current, emerging and critical issues in a timely manner.

Digitalisation has the potential to support national and international controls making them more effective and streamlined. It could also facilitate more predictive and accurate modelling of risk as well as targeting of resources that makes better use of existing or diminishing resources. Remote audits/inspections, automated controls, improved traceability, and the like are examples where benefits can be achieved.

This work is also linked to several sustainable development goals, such as SDG 12 Ensuring sustainable consumption and production patterns and SDG 17 Revitalizing the global partnership for sustainable development. The digitalisation of NFCS can assist governments to better develop, design and enforce food safety policies and regulations, become more efficient and reduce waste. By establishing a clear pathway for countries to adopt digital solutions and ways of operating, it can facilitate greater uptake and narrow the digital divide, which is important to continue to support a non-discriminatory and equitable multilateral trading system. It is also widely recognised that digitalisation will play a role in food system transformation, to a more sustainable model.

6. Information on the relation between the proposal and other existing Codex documents as well as other ongoing work

Several CCFICS texts reference using 'electronic means' or 'electronically' without further elaboration on what this entails. There are also several texts that also contain guidance on the collection, analysis and reporting of data from a scientific process rather than a digital perspective.

In other Codex Alimentarius texts, there is very little digital related content. Like CCFICS, several texts include guidance on the collection, analysis and reporting of data from a scientific process, but not from a digital perspective.

A summary of the preliminary gap analysis can be found at **Attachment 1**.

7. Identification of any requirement for and availability of expert scientific advice

None anticipated.

8. Identification of any need for technical input to the standard from external bodies so that this can be planned for

None anticipated.

9. Proposed timeline for completion of the new work, including the start date, the proposed date for adoption at Step 5, and the proposed date for adoption by the Commission; *the time frame for developing a standard should not normally exceed five years.*

Subject to the Codex Alimentarius Commission approval at its 47th Session in 2024, it is expected that the work can be completed in four to five years, depending on the future schedule of CCFICS meetings:

- Agreement to undertake new work at CCFICS 27: September 2024
- Approval as new work by CAC47: November 2024
- Proposed draft principles for consideration at Step 3 at CCFICS28: Oct 2026
- Proposed draft principles for consideration at Step 5 at CCFICS29: 2028
- Finalised for adoption at Step /8 at CCFICS30: 2029
- Adoption by CAC53: 2030

ANNEX 2

Summary of gap analysis of Codex Alimentarius texts

The following summarises the digital and data related content located in existing Codex texts. Although a more comprehensive gap analysis will need to be completed, this summary is intended to provide member countries with insight into what digital guidance exists to support their consideration of the need for further guidance to be developed.

Codex Committee on Food Import and Export Inspection and Certification Systems (CCFICS)

[CXG 19-1995](#) *Principles and Guidelines for the Exchange of Information in Food Safety Emergency Situations* (paragraphs 5.3 and 6.4), [CXG 25- 1997](#) *Guidelines for the Exchange of Information between Countries on Rejections of Imported Foods* (paragraphs 3), [CXG 261997](#) *Guidelines for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems* (paragraphs 38 and 40), [CXG 47-2003](#) *Guidelines for Food Import Control Systems* (paragraph 34), [CXG 89-2016](#) *Principles and guidelines for the exchange of information between importing and exporting countries to support the trade in food* (paragraph 5), [CXG 101-2023](#) *Guidelines on Recognition and Maintenance of Equivalence of National Food Control Systems (NFCS)* (paragraph 5.5), [CXG 93-2021](#) *Principles and Guidelines for the Assessment and use of Voluntary Third-Party Assurance Programmes*

Summary: The above listed guidelines and principles all preference using 'electronic means' or working 'electronically' with in the texts, which relates to the digitisation of data. There is minimal detail around what this entails and how it can be effectively and efficiently achieved in to streamline a workflow.

[CXG 91-2017](#) *Principles and Guidelines for Monitoring the Performance of National Food Control Systems* (paragraphs 10, 15, 23, 24, 41, 43, 46, 48, 49, 50. 53, 54, 55, 56 and 58)

Summary: These principles and guidelines contain information on the collection, analysis and reporting of data to monitor and assess the performance of NFCS. These are general considerations which would be relevant to high level principles, as data management is key for the success of digital systems across all elements and functions of the NFCS. This text also considers modifying approaches to consider technological advancements and evolving methods for data analysis.

[CXG 38- 2001](#) *Guidelines for Design, Production, Issuance and Use of Generic Official Certificates* (paragraphs 6, 29, 43, 48 and Annexes 1 & 2)

Summary: These guidelines provide specific information to underpin the ability of the competent authority(ies) to engage in paperless exchange of electronic certificates. Although specific to electronic certification, it contains guidance that could be applicable to the whole NFCS, such as the competent authority's digital capability, data security, data interoperability, data accuracy and trustworthiness, *inter alia*, which could be applicable to high level principles.

[CXG 93-2021](#) *Principles and Guidelines for the assessment and use of voluntary third-party assurance programmes* (especially references to the sharing of information and data)

Summary: These principles and guidelines contain information on the exchange of data between competent authority (ies) and voluntary third-party assurance programme (vTPA) owners. Although specific to interactions with vTPA, it contains guidance on data exchange between supply chain participate which could be applicable to the whole NFCS, such as use of technology platforms, credibility and integrity of data and data flow and dispersal.

[CXG 102-2023](#) *Principles and Guidelines on the Use of Remote Audit and Inspection in Regulatory Frameworks* (Section 1, Section 4 (paragraph 4), Section 5 (principle 1&4), Section 6, Section 7 (7.1)).

Summary: These principles and guidelines contain specific information on the use of digital technologies and tools to support remote auditing and inspection. Although specific to remote auditing and inspection, it contains guidance on collaboration with countries to deploy technologies to undertake regulator functions, consideration of the appropriate technology, IoT and ICT, which may also have broader application to the NFCS.

Codex Committee on Food Hygiene (CCFH)

[CXG 69 – 2008](#) *Guidelines for the Validation of Food Safety Control Measures*, [CXG 96-2022](#) *Guidelines for the management of biological foodborne outbreaks* and [CXG 100-2023](#) *Guidelines for the Safe Use and Reuse of Water in Food Production and Processing*

Summary: The above listed guidelines and principles either reference working 'electronically,' provide guidance on the collection, analysis and reporting of data for science-based decision making and/or storage of information. None of this guidance material has a digital focus. However, does capture common themes related to data use.

Codex Committee on Pesticides and residue (CCPR)

[CXG 97-2023](#) *Guidelines for the Recognition of Active Substances or Authorized Uses of Active Substances of Low Public Health Concern that are Considered Exempted from the Establishment of Maximum Residue Limits or do not give rise to Residues*

Summary: These guidelines contain information on the collection, analysis and reporting of data for science-based decision making in relation to active substances low public health concern.

Codex Intergovernmental Task Force on Antimicrobial Resistance (TFAMR)

[CXG 94-2021](#) - *Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance*

Summary: These guidelines contain information on the collection, analysis and reporting of data for science-based decision making in relation to foodborne antimicrobial resistance

CCFICS criteria to assist the Committee prioritise the development of new work.

Criterion	Rating
Relevance to CCFICS mandate	Yes
Immediate Urgency	Medium
Impact on Food Safety	Medium
Impact on fair trade practices	Medium