Real-Time Food Safety Assurance

365 Days of Trust — From Periodic Compliance to Continuous Learning

Cornelis van Elst

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Preface

Discussions of food safety typically center on rules, standards, audits, and certificates. These elements dominate how assurance is organized, how performance is evaluated, and how maturity is communicated.
They are important.
They are also incomplete.

This book was written from a simple observation: many food safety systems function exactly as they were designed to function — and still struggle to cope with the realities they face today.
Increasing complexity, accelerating change, globalized supply chains, and rising expectations have fundamentally altered the conditions under which food safety operates. Yet much of the assurance architecture remains rooted in models developed for a slower, more predictable world.
The result is not failure, but strain.
Organizations work harder to maintain compliance, auditors operate under increasing pressure, consultants fill recurring gaps, and regulators face growing oversight challenges — all within systems that prioritize periodic proof over continuous understanding.
This book does not argue against standards, audits, or certification. It does not question the professionalism or integrity of the people working within these systems. On the contrary, it assumes good intent throughout.
Its purpose is different.
The chapters that follow examine food safety as a **learning system** rather than merely a collection of compliance activities. They explore how knowledge is organized, how intelligence is built and retained, and how assurance evolves when understanding—not documentation—becomes the primary organizing principle.

Rather than proposing incremental improvement, this book asks structural questions:

- What kind of intelligence do current systems enable — and what do they suppress?
- How does assurance change when systems must operate continuously rather than episodically?
- Where does real control reside in modern food safety ecosystems?
- What does resilience look like when people, processes, and contexts change constantly?

The perspective offered here is grounded in practice rather than theory. It reflects years of observing how food safety systems perform under pressure—not just during audits, but in daily operations, incidents, and moments of uncertainty.
The intention is not to replace existing models, but to complete them.
Compliance provides order.
Learning provides adaptability.
Assurance becomes credible when both are designed together.

This book is written for food safety professionals, quality leaders, regulators, auditors, and decision-makers who recognize that the system must evolve—not because it is broken, but because the world it operates in has changed.
The transformation ahead is not about doing more.
It is about **learning better**.

About the Author — Ir. Cornelis van Elst

Ir. **Cornelis van Elst** is a Dutch expert in food safety and assurance systems, known for transforming food safety from audit-driven compliance to learning-based, real-time assurance.

With an engineering background and more than two decades of experience in the food industry, he has worked at the intersection of **food safety management, regulatory interpretation, digital infrastructure, and organizational learning**. His work spans primary production, food manufacturing, retail supply chains, and public-private governance models.

Cornelis is the founder of **QAssurance**, a Dutch RegTech initiative focused on redesigning food safety systems around structured knowledge, continuous learning, and real-time insight. Through this work, he has been closely involved in the development and implementation of **digital food safety infrastructure** across multiple continents, including both mature markets and emerging economies.

Rather than approaching food safety as a certification challenge, his work focuses on **system behavior**: how organizations learn, how knowledge is retained, and how assurance remains credible in environments characterized by rapid change and increasing complexity. This perspective has led to collaborations with food companies, auditors, regulators, and government institutions seeking alternatives to purely audit-centric oversight models.

Cornelis is a frequent speaker on topics such as real-time food safety assurance, learning organizations, RegTech infrastructure, and the future of audits and certification. His work emphasizes that food safety is not primarily a documentation or technology problem, but a system design problem—one that requires rethinking how intelligence is organized and governed.

This book reflects his practical experience and system-level thinking. It does not propose a new standard or methodology. Still, it offers a coherent framework for understanding why existing models struggle—and how food safety can evolve from periodic proof to continuous assurance grounded in learning.

Executive Summary

Food safety systems worldwide appear robust. Standards are established, certification schemes are widely adopted, audits are routinely performed, and compliance is carefully documented. On paper, control looks strong.

In practice, many of these systems struggle to cope with the realities they face today. This book starts from a simple observation: **food safety has become more complex, faster-moving, and more interconnected than the assurance models designed to govern it**. While risk dynamics have accelerated, much of the assurance architecture remains rooted in periodic verification, retrospective proof, and external validation. The result is not failure, but structural strain.

Organizations work harder to maintain compliance without necessarily gaining a deeper understanding. Auditors operate under increasing pressure within narrow mandates. Consultants fill recurring gaps without transferring durable capability. Regulators face growing oversight challenges with limited real-time visibility.

This book argues that the challenges of food safety stem not from insufficient standards or effort, but from a **learning deficit created by system design**.

From Compliance to Learning to Assurance

The book introduces a three-phase perspective on food safety maturity:

- **Phase 1: Compliance**—establishing procedures, maintaining records, and demonstrating conformity through audits
- **Phase 2: Learning**—building systematic understanding of how systems behave, how risks evolve, and how knowledge flows across domains
- **Phase 3: Assurance**—achieving sustained confidence through continuous insight, integrated intelligence, and the capacity to detect and respond to emerging conditions

Certification systems were designed to establish Phase-1 compliance. They do this effectively and remain necessary. However, when organizations treat certification as the endpoint of maturity, learning capacity stagnates, and assurance becomes symbolic rather than operational.

The core issue is not competence or intent. It is that **systems optimized for proof suppress the development of organizational intelligence**.

Food Safety as a Knowledge and Learning System

The book reframes food safety as one of the most knowledge-intensive functions in any organization. Every day, food safety professionals must interpret changing legislation, evolving standards, supplier behavior, customer expectations, and internal process dynamics.

Traditional compliance models treat this work as documentation and administration. In reality, it is interpretive knowledge work in an uncertain environment.

This book identifies five core food safety knowledge domains that organizations must integrate: legislation (regulatory requirements), standards (certification and industry norms), the organization itself (internal processes and capabilities), suppliers (supply chain risk and performance), and customers/consumers (market requirements and expectations). It demonstrates how fragmentation across these domains undermines both understanding and resilience.

True maturity emerges not from more documents, but from **how knowledge is structured, shared, validated, and retained**.

Why Audits and PDCA Are No Longer Sufficient Alone

Plan–Do–Check–Act (PDCA) and audit-based assurance were designed for slower, more stable systems. In modern food systems, feedback delays create risk.

The book introduces **Sense & Respond** as a primary operating logic that precedes PDCA. This approach emphasizes continuous monitoring of system behavior across all five domains—legislation, standards, internal operations, suppliers, and customers—enabling early, proportional responses and explicit learning.

PDCA remains valuable — but as a secondary cycle that consolidates learning, not as the primary mechanism for situational awareness.

Economic Distortion and Dependency

A significant portion of the book examines how current food safety economics reinforce outdated models.
Disproportionate spending on external checking, audits, and preparation cycles crowds out investment in sensing, interpretation, and learning. Consultant dependency provides reassurance without building internal intelligence. Phase-1 models persist not because they are optimal, but because they align well with scalable, predictable revenue structures.
This is not a critique of professionals or institutions. It is a critique of **incentive alignment**.

Real-Time Assurance and Infrastructure Thinking

The book argues that **real-time food safety assurance is no longer a vision**. The necessary technological and organizational components already exist. What is missing is a structural redesign.
Real-time assurance shifts assurance from episodic proof to continuous understanding. It reduces cost by eliminating redundancy, lowers stress by smoothing effort, and improves resilience by enabling early action.
Crucially, the book reframes food safety power as residing not in certificates, but in **knowledge infrastructure**. Whoever owns the interpretation, connection, and governance of knowledge domains owns the system.
This insight enables new models at scale.

Sovereign and G2B Models

The book explores how government-to-business (G2B) and sovereign assurance models can deliver shared infrastructure, continuous oversight, and cost justice—particularly in emerging economies where audit-centric models are economically and structurally unsustainable.
Rather than replicating the historical audit trajectory of mature markets, countries can leapfrog directly to learning-based, real-time systems that strengthen local capacity while meeting global expectations.