

FFI Report

A Review of ISO Standards Terminology Regarding Product Integrity and Authenticity

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SUMMARY: A review of International Standards Organization (ISO) published standards revealed that the core food fraud related terms have been used across many disciplines (e.g. integrity, authenticity, authentication, adulterant, adulteration, adulterated and product fraud from <https://www.iso.org/obp/ui/#search>). Table 1 includes a keyword search summary of entries in the “Terms & Definitions” sections of ISO standards. An expanded Table 2 includes detailed quotes and Table 3 includes **adulterant** and **product fraud**.

Key points and discussion

- **Integrity:** There is ISO precedence such as for “structural integrity” or “data integrity” which is then logical to extend to “food integrity.” A challenge is that this seems to be a focus on the quality level and meeting the specifications, but this could cover all food risks including quality, safety, fraud, and defense.
- **Authenticity:** This is an “act or process” to provide the claims. It is not an end-state.
- **Authentication:** The process of proving “authenticity.” This is the action and not an end-state.
- **Authentic:** This is the state of being. This is the end-state or goal.
- **Adulterant:** Is something material (substance) intentionally added without permission.
- **Adulteration:** Is the act of an adulterant (substance) being added included – past tense is “-ed.”
- **Product Fraud:** there is actually a definition and the standard also includes food.
- **Note: Product Fraud** and **Authentic** claims are usually pertain to intellectual property rights/ counterfeiting.

Table 1: Term	Results (Total)	Summary Definition based on ISO Usage – Identified in the “Terms and Definitions” Sections (with under 25 word summary)
Integrity	195	Summary: The statement of the unimpaired, unaltered, and unmodified condition of the item with safekeeping of the accuracy, completeness of the claim.
Authentication	287	Summary: The act or process of proving something is genuine, assurance of the claimed identity such as origin or performance.
Authenticity	16	Summary: “Property of being of undisputed origin and not a copy, authenticated, and having the origin supported by unquestionable evidence.”
Authentic	3	Summary: not false or imitation, genuine, having the apparent quality or character represented (expanding from ISO to Merriam-Webster’s Dictionary).
Adulterant	1	Summary: materials or substances intentionally added to the product for economic gain (or avoiding loss) or for intentional harm.
Adulterate (-ion, -ed)	1	Summary: based on the word “adulterant,” “adulterated” is the past tense and “adulteration” is the action of adding or removing an adulterant. Note: this is in conflict with the FDA Food Drug & Cosmetics Act definition of “Adulterated Foods” that does not require a adulterant.
Product Fraud	1	Summary: deception utilizing material goods for economic gain or avoiding al loss”



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Appendix

Table 2: Detailed Quotes from a Keyword Search for entries in the Terms & Definitions Sections of ISO Standards: Integrity, Authentication, Authenticity, and Authentic

Term	Total	Summary Definition (with under 25 word summary)
Integrity	195	<p>Summary: <i>The statement of the unimpaired, unaltered, and unmodified condition of the item with safekeeping of the accuracy, completeness of the claim.</i></p> <ul style="list-style-type: none"> • “property that data has not been modified or deleted in an unauthorised and undetected manner”[h] • “probability of a system satisfactorily performing the required function under all the stated conditions within a stated period”[i] • “state of an artefact that has not been altered, deliberately or accidentally” [j] • “property of safeguarding the accuracy and completeness of assets” [k] • “the property of the unimpaired condition of the authentication element, the associated data, the information or the elements and the means for processing them” [k] • “attribute of a document whose content is completed and unaltered” • “physical acceptability of a [product] to meet the specification designated by the [product] supplier” • Note: Usually presented with an evaluation of a meeting requirements (e.g., safety integrity level); Note: only one result mentioned ethical or personal value, e.g., “adherence to ethical principles” [c]
Authentic- ation	287	<p>Summary: <i>The act or process of proving something is genuine, assurance of the claimed identity such as origin or performance.</i></p> <ul style="list-style-type: none"> • “Process of determining whether an entity or data is/are who or what, respectively, it claims to be. [f] • “action of proving that someone or something is genuine”[e] • “assurance of the claimed identity” • “provision of assurance that a claimed characteristic of an entity is correct” [g] • “process of determining whether an entity or data is/are who or what, respectively, it claims to be.” • “the act of proving or showing to be of undisputed origin or veracity”
Authenti- city	16	<p>Summary: <i>“Property of being of undisputed origin and not a copy, authenticated, and having the origin supported by unquestionable evidence”[d]</i></p> <ul style="list-style-type: none"> • “property that an entity is what it claims to be” • “The property that the claimed data source can be verified to the satisfaction of the recipient.”
Authentic	3	<p>Summary: <i>not false or imitation, genuine, having the apparent quality or character represented.</i></p> <ul style="list-style-type: none"> • “Authentic material: document-based information the accuracy, reliability and integrity of which are maintained over time”[m] • “Authentic material good: material good produced under the control of the legitimate manufacturer, originator of the good or holder of intellectual property rights” [k] • “Authentic record: record that can be proven: a) to be what it purports to be, b) to have been created or sent by the person purported to have created or sent it, and c) to have been created or sent at the time purported”[n] • Note: Webster’s Dictionary: “2 : not false or imitation, genuine”; Genuine – “1 a : actually having the reputed or apparent qualities or character, b : actually produced by or proceeding from the alleged source or author the signature is genuine”

[a] ISO 7540:2006(en): Ground paprika (*Capsicum annuum* L.) — Specification

- [b] ISO 24114:2011(en): Instant coffee — Criteria for authenticity
- [c] ISO 20121:2012(en): Event sustainability management systems — Requirements with guidance for use
- [d] ISO/TR 17427-4:2015(en): Intelligent transport systems — Cooperative ITS — Part 3: Concept of operations (ConOps) for 'core' systems
- [e] ISO 8583-1:2003(en): Financial transaction card originated messages — Interchange message specifications — Part 1: Messages, data elements and code values
- [f] ISO/IEC 18000-63:2015(en): Information technology — Radio frequency identification for item management — Part 63: Parameters for air interface communications at 860 MHz to 960 MHz Type C
- [g] ISO/IEC 27000:2016(en): Information technology — Security techniques — Information security management systems — Overview and vocabulary
- [h] ISO/IEC 19790:2012: Information technology— Security techniques— Security requirements for cryptographic modules
- [i] ISO 10418:2003(en): Petroleum and natural gas industries — Offshore production installations — Analysis, design, installation and testing of basic surface process safety systems
- [j] ISO 18308:2011(en): Health informatics — Requirements for an electronic health record architecture
- [k] ISO 28002:2011: Security management systems for the supply chain — Development of resilience in the supply chain — Requirements with guidance for use
- [k] ISO 12931:2012(en): Performance criteria for authentication solutions used to combat counterfeiting of material goods
- [m] ISO/TR 18492:2005(en): Long-term preservation of electronic document-based information
- [n] ISO 18829:2017: Document management — Assessing ECM/EDRM implementations — Trustworthiness

Related Terms:

- **Authentication method:** process of identity authentication using one or more authentication factors, ISO/IEC TR 29156:2015(en)2
- **Authentication solution:** complete set of means and procedures that allows the authentication of a material good to be performed, ISO 12931:2012(en), 2.3.3
- **Authentication tool:** set of hardware and/or software system(s) that is part of an anticounterfeiting solution and is used to control of the authentication element, ISO 12931:2012(en), 2.3.2
- **Intrinsic authentication element:** authentication element which is inherent to the material good, e.g., an attribute of a food such as a DNA test, ionization of water, etc., ISO 12931:2012(en),

Table 3: Additional Related Terms Detailed Quotes from a Keyword Search for entries in the Terms & Definitions Sections of ISO Standards: Adulterant, Adulterate, and Product Fraud

Term	Total	Summary Definition (with under 25 word summary)
Adulterant	1	<p>Summary: materials or substances intentionally added to the product for economic gain (or avoiding loss) or for intentional harm</p> <ul style="list-style-type: none"> “materials added to improve the low quality of the product or to mask its defects” [a][bb]
Adulterate (-ion, -ed)	1	<p>Summary: based on the word “adulterant,” “adulterated” is the past tense and “adulteration” is the action of including an adulterant – this is in conflict with the FDA Food Drug & Cosmetics Act definition of “Adulterated Foods” that does not require a adulterant.</p> <ul style="list-style-type: none"> “Adulterated soluble coffee: products prepared by the co-extraction or the separate extraction of roasted coffee beans and of raw or roasted materials other than coffee beans, where the product is sold as pure soluble coffee and the addition of the non-coffee bean material is not declared on the label” [cc] “alteration of the composition of a lot (3.18) of cocoa by any means whatsoever”
Product Fraud	1	<p>Summary: deception utilizing material goods for economic gain or avoiding a loss”</p> <ul style="list-style-type: none"> “wrongful or criminal deception utilizing material goods for financial or personal gain, Note 1 to entry: Fraud means wrongful or criminal deception intended to result in financial or personal gain creating social or economic harm, Note 2 to entry: Products include electronic media carried on material goods, Note 3 to entry: Fraud related to digitally transmitted electronic media needs to be considered separately.” [aa]

[aa] ISO/DIS 22380(en): Security and resilience — Authenticity, integrity and trust for products and documents — General principles for product fraud risk and countermeasures

[bb] ISO 2451:2017(en) Cocoa beans — Specification and quality requirements

[cc] ISO 24114:2011(en) Instant coffee — Criteria for authenticity

Note: Our team conducts a wide range of teaching, research and outreach projects. The Food Fraud Insight Report series (“FFI Report” or FFIR) series was created to review specific emerging topics or recent laws, regulations, certifications, standards, or best practices. The summary and insight is not legal advice and is not intended to replace the counsel of a food law expert.

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