

SLOVENSKI STANDARD SIST EN 16104:2013

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Podatki o živilu - Struktura in format za izmenjevanje

Food data - Structure and interchange format

Lebensmitteldaten - Struktur und Austauschformat

Données sur les aliments Structure et format d'échange VIEW

Ta slovenski standard je istoveten z: EN 16104:2012

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Food data - Structure and interchange format

Données sur les aliments - Structure et format d'échange

Lebensmitteldaten - Struktur und Austauschformat

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Foreword

This document (EN 16104:2012) has been prepared by Technical Committee CEN/TC 387 "Food data", the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2013, and conflicting national standards shall be withdrawn at the latest by June 2013.

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According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

The term *food* generally refers to substances intended for human consumption, normally with exceptions for e.g. medicines, and includes raw or processed food products and substances used in the manufacture. The exact definition, however, may vary depending on legislation and cultural differences. This standard can be used regardless of such variations.

This standard uses *food properties* as a general term when describing food constituents such as nutrients, heavy metals, micro-organisms, but also when describing various physico-chemical properties of foods.

Food data address description and identification of foods and their food properties. They are needed and used for many purposes, e.g. labelling, product development, dietary treatment, nutritional treatment, consumer information, and research. Thus, there are many types of parties that need to generate, compile, interchange, or access detailed information about foods. These include:

- Food manufacturers
- Food analysis laboratories
- Authorities
- Researchers
- Resellers

- Retailers <u>SIST EN 16104:2013</u> https://standards.iteh.ai/catalog/standards/sist/3d0e11c2-b9de-4764-895c-5fc411e62d69/sist-en-16104-2013

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- Nutritionists/dieticians
- Food distributors
- Consumers
- Restaurants/food service operators
- Software developers

The ability and need to manage food information vary between these parties. There are multiple instances of all parties mentioned, which means that the information is interchanged in a large number of relations between parties. For example, a food manufacturer may have the need to communicate food information with multiple resellers, multiple retailers, multiple distributors and multiple authorities in multiple countries, and so on.

Currently, there are differences among member states and parties in the way food data are expressed with respect e.g. food description, definition of nutrients and other food properties, and methods used to generate compositional values. A common European Standard, established within the CEN framework, is a key tool enabling unambiguous identification and description of food data and its quality in e.g. databases, for dissemination and interchange.

Several European and international initiatives have focused on improving and harmonising food data description and interchange. This standard is based on two initiatives: the EuroFIR project [11] (an EC Network of Excellence funded by the 6th Framework Programme for Research and technological Development) 2005-2010 and Food and Beverage Extension to the GS1 GDSN Trade Item standard [14].

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'The Eurofir project mainly concerned specifications for documentation and interchange of data on nutrients and bioactive substances in food composition databases, while the GS1 standard was intended for use by trading partners in both the food service as well as the food retail sector. In addition, a set of use cases were developed and analysed. This standard was also aligned with the EFSA Standard Sample Description [17], and certain elements and specifications were incorporated. As a result, this standard is more innovative and broader in scope - in so far as it should be fit for the purposes of all these parties.

The main aim of the standard is to provide a framework that facilitates and enables generation, compilation, dissemination and interchange of food data that are comparable and unambiguous with respect to the identity of foods, the description of foods and food property measures including their quality. The standard is structured to be robust and flexible enough to incorporate future extensions with respect to various types of data.

This standard will make it possible for any party in a community to send understandable food data to any other receiving party in that community. However, this standard does not include all definitions that are required. For example, the set of food properties that can be used, such as contents of various nutrients and heavy metals, is not included in the standard. These and all other so called controlled vocabularies will be agreed upon within the community. An annex of the standard provides examples of required controlled vocabularies.

The reasons for not including the controlled vocabularies are:

- Most controlled vocabularies, for example with new food properties, will be constantly updated.
- Communities around the world are maintaining and using their own controlled vocabularies.

The exchange of food data among different parties requires an agreement on not only what data to exchange but also on the encoding of the data. This standard includes data encoding rules based on XML which today is the most recognised general technique for data encoding. ds.iteh.ai)

Figure 1 illustrates a case where food data is exchanged between databases of partners (1) in some kind of community. They want to use this standard to <u>set up a mutual</u> agreement (2). Apart from selecting the standard (3), such an agreement will contain selections of controlled vocabularies and restrictions on data. Most of the data specified in the standard require a controlled vocabulary to be specified (5). Such controlled vocabularies are maintained by various organisations. An agreement will select the controlled vocabularies to use. Restrictions on data will be defined (4). For example, an agreement may state that a scientific name has to be provided for all foods, despite the fact that it is not required in the standard. In addition, an agreement may specify requirements on what food properties are to be exchanged or what language to use.



Figure 1 — Agreement for food data exchange (A) that are based on this standard (S) will also specify a set of controlled vocabularies (V).

1 Scope

This European Standard specifies requirements on the structure and semantics of food datasets and of interchange of food data for various applications.

Food data refers to information on various food properties and includes various steps in the generation and publication of such data, e.g. sampling, analysis, food description, food property and value description.

The standard regards food data as datasets covering:

- identification, description and classification of foods including food ingredients,
- qualitative and quantitative food properties that can be measured, calculated or estimated,
- data quality values and other metadata,
- specifications of methods used for obtaining these values.
- references to sources for the information reported.

This standard includes requirements on:

- semantics and data structure for food data,
- content of referenced controlled vocabularies.
- XML encoding for interchange of food data siteh.ai)

This standard does not include:

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- food description methods, iteh ai/catalog/standards/sist/3d0e11c2-b9de-4764-895c-
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- quality assessment methods,
- content of controlled vocabularies, for example controlled vocabularies for nutrients,
- database implementation.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

association relation between classes

Note 1 to entry: This term refers to ISO/IEC 19501:2005 (Unified Modelling Language) [1].

2.2

attribute

characteristics of a class described by the values it can have

Note 1 to entry: This term refers to ISO/IEC 19501:2005 (Unified Modelling Language) [1].

2.3

class

definition of data for description of a certain concept

Note 1 to entry: Classes as described in ISO/IEC 19501:2005 (Unified Modelling Language) [1] may also describe operations and methods. That possibility is not used in this standard.

Note 2 to entry: A class is used as a specification of a data instance. For example a data instance of an employee may be specified by a class that specifies two attributes: the name and the salary of the employee.

Note 3 to entry: A class can be used by other classes to specify an attribute. For example, a class for dates may be used to specify a delivery date in one class and a birthday in another class.

EXAMPLE 1 A class that defines a data structure with a code representing a language and a text. https://standards.iteh.ai/catalog/standards/sist/3d0e11c2-b9de-4764-895c-

EXAMPLE 2 A class that defines a set of codes for representation of languages.

EXAMPLE 3 A class that defines a text as a sequence of characters.

2.4

class diagram

schema of associations between classes

Note 1 to entry: This term refers to ISO/IEC 19501:2005 (Unified Modelling Language) [1].

2.5

controlled vocabulary

carefully selected set of terms such that each concept from the domain of discourse is described using only one term in the set and each term in the set describes only one concept

2.6

data instance

set of data that is specified by a class

2.7

datatype class class for specification of attributes

2.8 final preparation instruction

instruction for how to prepare a real food product to be ready-to-eat

Note 1 to entry: A food article often includes a final preparation instruction that tells how to prepare it before you can eat it.

2.9

food

substance intended for human consumption

Note 1 to entry: The term food generally refers to substances intended for human consumption, normally with exceptions for e.g. medicines, feed, cosmetics, tobacco, and includes raw or processed food products and substances used in the manufacture. The exact definition, however, may vary depending on legislation and cultural differences.

Note 2 to entry: Codex definition of food: "Food" means any substance, whether processed, semi-processed or raw, which is intended for human consumption, and includes drinks, chewing gum and any substance which has been used in the manufacture, preparation or treatment of "food" but does not include cosmetics or tobacco or substances used only as drugs (CODEX STAN 1-1985 [20]).

Note 3 to entry: EC definition of food: Food means "Any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans. 'Food' includes drink, chewing gum and any substance, including water, intentionally incorporated into the food during its manufacture, preparation or treatment. It includes water after the point of compliance as defined in Article 6 of Directive 98/83/EC and without prejudice to the requirements of Directives 80/778/EEC and 98/83/EC. 'Food' shall not include: (a) feed; (b) live animals unless they are prepared for placing on the market for human consumption; (c) plants prior to harvesting; (d) medicinal products within the meaning of Council Directives 65/65/EEC (1) and 92/73/EEC (2); (e) cosmetics within the meaning of Council Directive 76/768/EEC (3); (f) tobacco and tobacco products within the meaning of Council Directive 89/622/EEC (4); (g) narcotic or psychotropic substances within the meaning of the United Nations Single Convention on Narcotic Drugs, 1961, and the United Nations Convention on Psychotropic Substances, 1971; (h) residues and contaminants. (Regulation (EC) No 178/2002).

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2.10 https://standards.iteh.ai/catalog/standards/sist/3d0e11c2-b9de-4764-895cfood article real food product distributed in a specific packing

EXAMPLE 1 Canned tomato soup of a certain brand and type.

EXAMPLE 2 Corn flakes package of a certain brand and intended for a specific market.

EXAMPLE 3 Apples labelled with the apple variety and name of the producer.

2.11

food data

data identifying and describing properties of foods

2.12

food dataset

identified, structured collection of records of food data that can be stored or exchanged

2.13

food description system

method for systematic description of food as a combination of characteristics

Note 1 to entry: A food description system may include procedures for capturing and retrieval of information about the food.

Note 2 to entry: A food description system defines a set of aspects to be described and a set of food descriptors for each aspect.

2.14

food descriptor

single term in a controlled vocabulary for food description

2.15

food ingredient

food that is used in production of, and still present in, another food

EXAMPLE 1 According to EC directive 2000/13, an ingredient is any substance, including additives, that is used in, and still present after (even in an altered form), the manufacture or preparation of a food.

EXAMPLE 2 According to Codex Alimentarius "Ingredient" means any substance, including a food additive, used in the manufacture or preparation of a food and present in the final product although possibly in a modified form.

2.16

food ingredient list

list describing the absolute or relative quantity or the ranking of food ingredients in a food

2.17

food label information

information written on the package of a food article

2.18

food property

qualitative or quantitative characteristic for a food that can be measured, calculated or estimated

Note 1 to entry: Content of vitamins, minerals, allergens and micro-organisms as well as physico-chemical properties such as pH and specific gravity are examples of food properties.

 Note 2 to entry:
 Sets of food properties are defined and maintained by organisations such as EuroFIR [11], INFOODS [19], and CODEX [16].

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EXAMPLE Content of vitamin C; content of calcium; pH; viscosity; retention factor of vitamin C after boiling.

2.19

food property measure

value and unit of measure that quantifies or specifies a food property

Note 1 to entry: A food property measure may include statistical properties of the value.

2.20

food recipe

instructions on how to produce or prepare a food from a set of food ingredients

2.21

food sample

portion of a food that is assumed to represent the food

Note 1 to entry: UPAC [21] definition: portion of material selected from a larger quantity of material.

2.22

food sampling

procedure for the selection, withdrawal, preservation, transportation and preparation of the portions to be removed from a population as samples

2.23

food yield factor

value expressing the remaining compared to the original mass of a food after a certain processing or preparation

Note 1 to entry: This standard handles food yield factors as food properties.

2.24

generic food

abstraction of a food based on several occurrences of foods

Note 1 to entry: The description of a generic food is typically based on several occurrences, e.g. several food articles.

EXAMPLE 1 The food properties of a generic food "apple" may be based on samples of apples of different varieties and origin.

FXAMPI F 2 The food properties of a generic food "pasta" may be based on samples of pasta of different types and brands.

2.25

health claim

any representation that states, suggests or implies that a relationship exists between a food category, a food or one of its constituents and health

The definition of health claim may differ somewhat between different legislation: EC 1924/2006 [24]: Note 1 to entry: any claim that states suggests or implies that a relationship exists between a food category, a food or one of its constituents and health CAC/GL 23-1997 [22]: Health claim means any representation that states, suggests, or implies that a relationship exists between a food or a constituent of that food and health. Health claims include Nutrient function claims; Other function claims; Reduction of disease risk claims. en al

2.26

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multi-ingredient food food that is made from at least two food ingredients

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2.27

nutrient claim

any representation which states, suggests or implies that a food has particular nutritional properties

The definition of nutrient claim may differ somewhat between different legislation: EC 1924/2006 [24]: Note 1 to entry: any claim which states suggests or implies that a food has particular beneficial nutritional properties. CAC/GL 23-1997 [22]: Nutrition claim means any representation which states, suggests or implies that a food has particular nutritional properties including but not limited to the energy value and to the content of protein, fat and carbohydrates, as well as the content of vitamins and minerals. The following do not constitute nutrition claims: (a) the mention of substances in the set of ingredients; (b) the mention of nutrients as a mandatory part of nutrition labelling; (c) quantitative or qualitative declaration of certain nutrients or ingredients on the label if required by national legislation.

2.28

primary food sample

portion of a food initially collected from a food

Other definitions: IUPAC [21]: The collection of one or more increments or units initially taken from a Note 1 to entry: population. The portions may be either combined (composited or bulked sample) or kept separate (gross sample). If combined and mixed to homogeneity, it is a blended bulk sample. CAC/GL 50-2004 [23]: A primary sample is the 'portion of product' collected from a lot during the first stage of the sampling process, and will normally be in the form of an item (if collected from a lot of prepacked products) or of an increment (if collected from a bulk lot).

2.29

real food product

food that is produced harvested or gathered in a certain way independent of package type

Note 1 to entry: A real food product may be produced using a recipe.

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Note 2 to entry: A food article is a real food product that is packaged in a certain way.

Note 3 to entry: A food that is not a real food product, is a generic food.

EXAMPLE The production of a certain potato variety.

2.30

retention factor

value expressing the remaining compared to the original content of a food constituent after a certain processing or preparation

Note 1 to entry: This standard handles retention factors as food properties that are defined in a controlled vocabulary.

EXAMPLE 1 The retention factor of vitamin C after boiling.

EXAMPLE 2 The retention factor of fat after frying.

2.31

XML attribute

name-value pair within an XML element start tag

EXAMPLE The value-pair currency="USD" is an attribute in the following XML element: <price currency="USD">12.50</price>

2.32

XML element XML data encoding structure that is delimited by a start tag and an end tag VIEW

EXAMPLE

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Note 1 to entry: In the example above there are three XML elements: *employee*, *name* and *salary*. <name> is a start tag and </name> is an end tag of the *name* element.

3 Symbols (and abbreviated terms)

3.1 UML notation

This standard uses graphical UML notation in Clause 5 and in Annex B. For a complete description of the UML notation, refer to ISO/IEC 19501:2005, *Information technology -- Open Distributed Processing -- Unified Modeling Language (UML) Version 1.4.2* [1]. For an informative explanation of the UML notation, refer to Annex A.

3.2 Abbreviated terms and acronyms

URI Uniform Resource Identifier

NOTE A URI consists of a string of characters used to identify or name a resource on the Internet. There are two types: URL (Uniform Resource Locator) which is a resources web address and URN (Uniform Resource Name) which is only a unique name of the resource.

UML Unified Modelling Language

XML Extensible Markup Language

4 Data structure

4.1 General

The data structure is specified by three UML class diagrams. The division into three class diagrams is only due to readability. Figure 2 specifies the main data structure, Figure 3 specifies the class for bibliographical references and Figure 4 contains datatype classes to be used when specifying attributes in other classes.

Each class is documented in Clause 5 by a description providing semantics and a table of the attributes and association roles that are specified for the class.

Classes with bold border lines are those that will specify data instances that have an identifier. These data instances can be referred to by other data instances and will be encoded in a special way, as described in Clause 7.

The notation of class diagrams is described in Annex A.

https://standards.

NOTE All names of classes, attributes and association roles are symbolic names to be maintained unchanged if this standard is translated.

4.2 Main data structure

The class diagram in Figure 2 specifies the main data structure of a food dataset.

NOTE Annex B provides data instance examples and an informal explanation of the class diagram.

Table 1 lists the classes covered by Figure 2 with a reference to the description of each class.

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5fc4	Aggregation	5.7 ⁶¹⁰⁴⁻²⁰¹³	
	ArticleInfo	5.9	
	Composite	5.12	
	Contributor	5.14	
	Food	5.16	
	Ingredient	5.19	
	Measure	5.21	
	Method	5.22	
	MethodStep	5.23	
	Property	5.29	
	Recipe	5.32	
	Sample	5.34	
	Source	5.35	

Table 1 — Classes in Figure 2