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Traceability of honey

Specification of the information to be recorded in honey distribution chains

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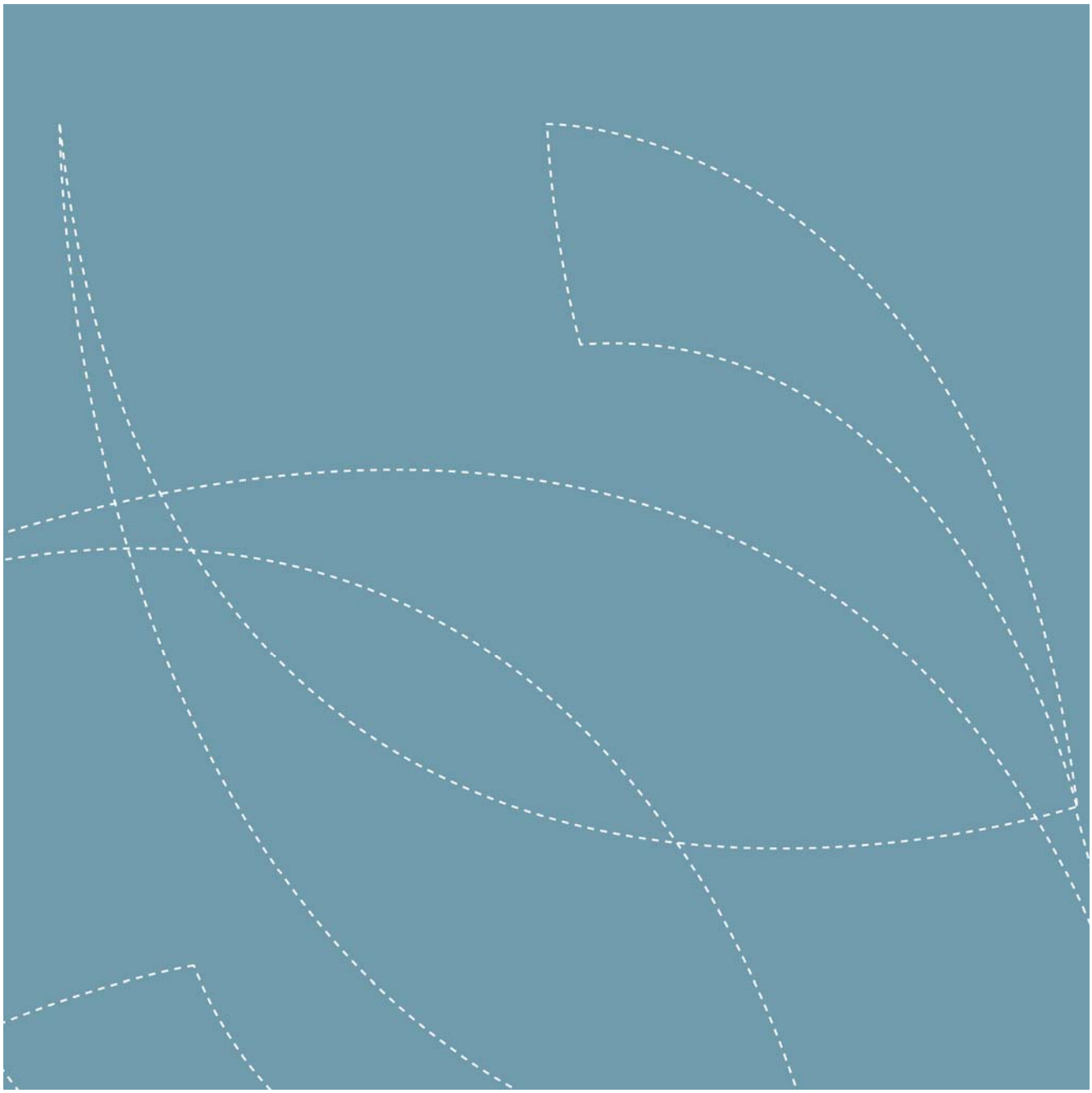

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Summary:

This ad-hoc standard has been created as part of the EU project 'Trace the origin of food' (TRACE). TRACE aims to develop generic and sector-specific traceability systems for use in the food industry. This ad-hoc standard forms part of the work undertaken with regards to honey. This standard is a specification of the information to be recorded in honey distribution chains to achieve good traceability.

Preface

This ad-hoc standard has been created as part of the EU project TRACE “Trace the origin of food”. TRACE aims to develop generic and sector-specific traceability systems for use in the food industry. This ad-hoc standard forms part of the work undertaken on honey and is part of the deliverable. This standard is a specification of the information to be recorded in honey distribution chains to achieve good traceability.

The authors are very grateful to all the industry contributions which we received, the work of the Analytic Tools Group (ATG) in TRACE and the support provided by the Traceability System Group (TSG) in TRACE.

Table of contents

1 Introduction

There are increasing demands for detailed information on the nature and origin of food products. Traceability is becoming a legal and commercial necessity. Transmission of all the required information physically with the products would, in many instances, be impracticable and so the use of information technology is preferable.

The International Standardization Organization's (ISO) definition of traceability concerns the ability to trace the history, application and location of that which is under consideration, and for products this can include the origin of materials and parts and processing history. Traceability includes not only the principal requirement to be able to physically trace products through the distribution chain, from origin to destination and vice versa, but also to be able to provide information on what they are made of and what has happened to them. These further aspects of traceability are important in relation to food safety, quality and labelling.

This document is an information specification for production of honey i.e. what information should be generated and held by the honey processor (ad-hoc standard).

The key to the operation of the scheme is the labelling of each unit of goods traded, whether of glass jars or plastic squeezers with honey, with a unique ID. This is to be done by the business that creates each unit. Businesses that transform units, such as honey processors, who convert the units of glass jars and metal caps received into the products dispatched, create new units and must give them new IDs.

Each of the businesses that create or physically trade in those units, throughout the distribution chains from glass jar producer or metal cap producer through to retailer or caterer, are to generate and hold the information necessary for traceability. The information is to be held on computer databases, keyed to the unit IDs.

The information remains in the ownership of the business that generated it, but is available when required by law for the purposes of traceability (in the event of a food safety problem) or by commercial agreement between businesses. The means of communicating the information is standardised so that it can be readily accessed from business to business through the distribution chains, when required.

This is a development beyond the forthcoming EU legal requirement (General Food Law), which came into force January 1st. 2005, for each food business to independently record sources of supplies and destinations of foods, but builds on that basis.

Commercial arrangements for businesses to communicate information through the distribution chains are to be encouraged, particularly for the information desired by the trade to be *visible* at the various transaction points in the chains, but that is not the subject of this document.

The method of identifying the units of goods traded is based on the GS1 system that is already in use throughout the world. The information is keyed to unique IDs given to the individual trade units (e.g. boxes of honey) but the scheme also accommodates trade in logistic units made up of numbers of trade units (e.g. pallets of boxes). Businesses that create logistic units have to label them with a logistic unit ID and also record the IDs of the component trade units.

The scheme does not demand perfect traceability, i.e. that a particular retail product should be traceable back to a batch of origin, or vice versa from origin to destination. Pragmatically it is recognised that mixing of units is likely to occur at a number of stages in the distribution

chains, e.g. in the production of caps or glass jars into jars filled with honey. Where such mixing occurs, the business is transforming the trade units. The requirement for traceability is that the business records the IDs of the received trade units that may be input to each created trade unit, and vice versa. The particular product is then traceable back to a definite number of jars and caps, and vice versa.

The information itemised in the specifications for recording by the food businesses includes:

- the fundamental information necessary to identify and physically trace the products, that shall be recorded;
- specific information that is required by law in relation to food safety, quality and labelling, together with important elements of commercially desirable information related to those matters, that should be recorded;
- also further specific and commercial information considered to be of sufficient relevance to be included in the specifications, that may be recorded.

Given the enormous variety of legal requirements of honey, the information specifications cannot itemise all the information that may possibly be required in every situation. The specifications provide a generic basis for traceability. Flexibility is allowed for businesses to record further information, in their own non-standardised files, but keyed to the unit IDs.

Although virtually every distribution chain is different, they all appear to be made up of a number of characteristic components or *building blocks*. The types of business identified in this document for honey distribution chains are:

- drum producers
- bee keepers
- plastic squeezers
- plastic squeeze caps
- glass jars
- glass jars lids
- honey processors
- transporters and storage holders
- wholesalers/retailers/supermarket

Any given honey distribution chain may be made up of some or all of these components but not necessarily in the sequence listed.

The information specifications separately tabulate the information to be recorded by each of these types of business. All tables apart from the tables regarding honey processors are a skeleton for a recommendation/ad-hoc standard for the respective previous links. In order to completely these tables a complete sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

Some businesses may carry out the functions of more than one of the types listed, for example distribution businesses may act as *transporters*, in which case those businesses must record the relevant information requirements for each of the functions carried out.

These specifications will provide a basis for information technology (IT) service providers to develop business solutions (applications) for the trade. The information specifications do not preclude the use of paper systems, although the obvious benefits of business efficiency, including rapid communication, will be lost.

Further information on the background to the development of the scheme and on its philosophy is given in informative annexes A and B.

2 Scope

This document specifies the information to be recorded in distribution chains in order to establish the traceability of honey. The types of honey to be distinguished can be raw honey and various strained or filtered honeys, usually referred to as homogeneous honey. The so called comb honey, which is honey still in the wax comb, is not the scope in this ad-hoc standard.

This document specifies how commercial honey is to be identified and the information is to be generated and held on those products by each of the businesses that physically trade them through the distribution chains.

This document is applicable to the distribution of honey for human consumption, including producers of packaging materials, like glass jars, metal caps and plastic squeezers and plastic caps, through to retailers or caterers.

3 Normative references

This ad-hoc standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ad hoc standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments)

4 Terms and definitions

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

4.1 Honey

A general definition of honey is: a sweet viscous substance elaborated by honey bees from nectar of flowers (Singhal et al, 1997). The US National Honey board states: honey is a pure product that does not allow for addition of any other substance. In the European Union, directive 2001/110/EC indicates: no additives, colouring agents etc. are allowed in honey.

Honey contains 14 – 18 % of moisture (= water) and 60 – 80% sugars, mainly monosaccharide's like glucose and fructose. The composition of honey however depends highly on the type of flowers utilized by the bee as well as climatic conditions.

4.2 Traceability

The International Standardization Organization (ISO) defines traceability as (NS-EN ISO 9001:2000):

Ability to trace the history, application or location of that which is under consideration

NOTE when considering products traceability can relate to

- the origin of materials and parts
- the processing history

5 Symbols and abbreviations

AI	GS1 system Application Identifier
GLN	GS1 system Global Location Number
GMP	Good Manufacturing Practice.
GS1	Global Solution 1
GS1 system	Unique global identification system
GTIN	GS1 system Global Trade Item Number.
GTIN+	GTIN plus a further number to uniquely identify each particular trade unit (e.g. the production batch and serial number or the date and time of production).
ID	Identification
ISO	the International Organization for Standardization
n2 or n14, etc	GS1 identifier numbers consisting of 2 or 14, etc digits
SGTIN	SGTIN is a method of identifying unique items at the unit or retail level as well as at the case and carton levels. It is a GTIN combined with a Serial Number
SSCC	GS1 system Serial Shipping Container Code

6 Requirements

6.1 The identification of the units traded

Honey shall be traded as uniquely identified and labelled units.

Businesses that create trade units shall identify and label each of them with a GTIN+/SGTIN.

Businesses that create logistic units, made up of numbers of separately identified trade units, shall identify and label each logistic unit with a SSCC.

6.2 The recording of information

Businesses that physically trade in honey shall generate and hold the required information, appropriate to the type of business, for each of the units traded.

The following tables 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.10 and 6.11 are intended to give details of which information should be passed from the previous link in the production chain to this link in the production chain.

The detailed information requirements are tabulated below as follows:

- for drum producers in 6.3;
- for bee keepers in 6.4;
- for plastic squeezers in 6.5;
- for plastic squeezer caps in 6.6;
- for glass jars in 6.7;
- for glass jars lids in 6.8
- for honey processors in 6.9
- for transporters and storage holders in 6.10
- for wholesalers/retailers/supermarket in 6.11

Businesses that carry out the functions of more than one of the categories listed above shall record the information relevant to each of the functions carried out.

The data elements tabulated in table 6.3 to table 6.11 categorised as *shall* are considered to be fundamental information necessary to identify and physically trace the products. These elements must be recorded to achieve traceability.

The data elements tabulated in table 6.3 to table 6.11 categorised as *should* are specific information required by law in relation to food safety, quality and labelling together with important elements of commercially desirable information related to those matters. It is recommended that these elements are recorded.

The data elements tabulated in table 6.3 to table 6.11 categorised as *may* are further specific information required by law and commercially desirable information, considered to be of sufficient relevance to be included in the document. Businesses may choose to record these elements.

NOTE In these tabulations there is no repetition of the information originally recorded to describe the units created and their history, although businesses receiving those units later in the distribution chain will often need some of that information. The information is keyed to the unit IDs and can be supplied by commercial agreement between the businesses without having to re-input the data.

6.3 Drum producers

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *drum producers* are considered to be the producer and deliverer of drums to the bee keepers.

Table 1 Detailed information requirements for drum producer

Data element		Description	Examples	Categorisation		
				Shall	Should	May
DRUM PRODUCER						
HDP01	Producer ID	Name and address or GLN of drum producer	Drums Ltd., Albert Street, Hull, HU1 7AR, England or n3+n13	x		
HDP02	Production establishment ID	Name, address and registration number or GLN of production establishment	Drums Ltd.., Charles Street, Hull, HU1 7AR, England or n3+n13	x		
FOR EACH TRADE UNIT CREATED						
Identity						
HDP03	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
HDP04	Logistic unit ID	SSCC	n2+n18	x		
HDP05	Trade unit Ids	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HDP06	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HDP07	Next business ID	Name and address or GLN of the business to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HDP08	Date and time of dispatch	Date and time of transfer to next business	2009-06-28T04:00	x		

6.4 Bee keepers

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *bee keepers* are considered to be persons that keep bees in order to collect honey and deliver the honey to the honey processor.

Table 2 Detailed information requirements for bee keeper

Data element		Description	Examples	Categorisation		
				Shall	Should	May
BEE KEEPER						
HBK01	Producer ID	Name and address or GLN of the Bee keeper	The Honey Farm, 22 Prince Street, Cheshire, SK5 7TK, England or n3+n13	x		
HBK02	Production establishment ID	Name, address and registration number or GLN of production establishment	The Honey Farm, 1 Bee way, Cheshire, SK5 7TK, England or n3+n13	x		
FOR EACH UNIT OF DRUMS RECIEVED						
Identities						
HBK03	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
HBK04	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (if received as a logistic unit)	List of n2+n14+AIs	x		
Source						
HBK05	Transporter ID	Name and address or GLN of transporter from whom the unit was received	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HBK06	Date and time of reception	Date and time of transfer from transporter	2009-06-28T08:30	x		
Control checks (related to the logistic or separate trade units, as appropriate)						
HBK07	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			x
Transformation information (for each trade unit)						
HBK08	Related created trade unit IDs	List of the GTIN+s of the created trade units that may incorporate part of the received trade unit	List of n2+n14+Ais	x		
FOR EACH NEW TRADE UNIT CREATED						

Data element		Description	Examples	Categorisation		
				Shall	Should	May
Identity						
HBK09	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
HBK10	Logistic unit ID	SSCC	n2+n18	x		
HBK11	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HBK12	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HBK13	Transporter ID	Name and address or GLN of the transporter to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HBK14	Date and time of dispatch	Date and time of transfer to transporter	2005 06 28, 07:30	x		

6.5 Plastic squeezers

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *plastic squeezer producers* are considered to be the producer of the plastic squeezers and deliver the plastic squeezers to the honey processor.

Table 3 Detailed information requirements for plastic squeezer producers

Data element		Description	Examples	Categorisation		
				Shall	Should	May
PLASTIC SQUEEZER PRODUCER						
HPS01	Producer ID	Name and address or GLN of the Plastic squeezer producer	The plastic squeezer Company, 22 Prince Street, London, SE5 7TK, England or n3+n13	x		
HPS02	Production establishment ID	Name, address and registration number or GLN of production establishment	Grimsby plastic squeezers, Cap Dock Road, Grimsby, GY1 9SE, England. GY789 UK or n3+n13	x		
FOR EACH NEW TRADE UNIT CREATED						
Identity						
HPS03	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
HPS04	Logistic unit ID	SSCC	n2+n18	x		
HPS05	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HPS06	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HPS07	Transporter ID	Name and address or GLN of the transporter to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HPS08	Date and time of dispatch	Date and time of transfer to transporter	2009 06 28, 07:30	x		

6.6 Plastic squeezer caps

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *plastic squeezer cap producers* are considered to be the producer of the plastic squeezer caps and deliver the plastic squeezer caps to the honey processor.

Table 4 Detailed information requirements for plastic squeezer cap producer

Data element		Description	Examples	Categorisation		
				Shall	Should	May
PLASTIC SQUEEZER CAP PRODUCER						
HPSC01	Producer ID	Name and address or GLN of Plastic squeezer caps producer	Humber Caps., Albert Street, Hull, HU1 7AR, England or n3+n13	x		
HPSC02	Production establishment ID	Name, address and registration number or GLN of production establishment	Humber caps. Charles Street, Hull, HU1 7AR, England or n3+n13	x		
FOR EACH TRADE UNIT CREATED						
Identity						
HPSC03	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
HPSC04	Logistic unit ID	SSCC	n2+n18	x		
HPSC05	Trade unit Ids	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HPSC06	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HPSC07	Next business ID	Name and address or GLN of the business to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HPSC08	Date and time of dispatch	Date and time of transfer to next business	200906-28T04:00	x		

6.7 Glass jar producers

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *glass jar producers* are considered to be the producer of the glass jars and deliver the glass jars to the honey processor.

Table 5 Detailed information requirements for glass jar producers

Data element		Description	Examples	Categorisation		
				Shall	Should	May
GLASS JAR PRODUCER						
HGJ01	Producer ID	Name and address or GLN of glass jar	Humber hlass jars ltd Street, Hull, HU1 7AR, England or n3+n13	x		
HGJ02	Production establishment ID	Name, address and registration number or GLN of production establishment	Humber glass jars Ltd.., Charles Street, Hull, HU1 7AR, England or n3+n13	x		
FOR EACH TRADE UNIT CREATED						
Identity						
HGJ03	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
HGJ04	Logistic unit ID	SSCC	n2+n18	x		
HGJ05	Trade unit Ids	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HGJ06	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HGJ07	Next business ID	Name and address or GLN of the business to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HGJ08	Date and time of dispatch	Date and time of transfer to next business	2009-06-28T04:00	x		

6.8 Glass jar lids

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *glass jar lid producers* are considered to be the producer of the glass jar and deliver the glass jar to the honey processor..

Table 6 Detailed information requirements for glass jar lid producer

Data element		Description	Examples	Categorisation		
				Shall	Should	May
GLASS JAR LID PRODUCER						
HGJL01	Producer ID	Name and address or GLN of 5.8 Glass jars lids producer	Humber Ltd., Albert Street, Hull, HU1 7AR, England or n3+n13	x		
HGJL02	Production establishment ID	Name, address and registration number or GLN of production establishment	Humber Pre-forms Ltd.., Charles Street, Hull, HU1 7AR, England or n3+n13	x		
FOR EACH TRADE UNIT CREATED						
Identity						
HGJL03	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
HGJL04	Logistic unit ID	SSCC	n2+n18	x		
HGJL05	Trade unit Ids	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HGJL06	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HGJL07	Next business ID	Name and address or GLN of the business to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HGJL08	Date and time of dispatch	Date and time of transfer to next business	2005-06-28T04:00	x		

6.9 Honey processors

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *honey processors* are considered to be businesses that produce plastic squeezers and/or glass jars filled with honey. The honey processors create new trade units and do not add anything to the honey.

Table 7 Detailed information requirements for honey processors

Data element		*Description*	*Examples*	*Categorisation*		
				Shall	*Should*	*May*
HONEY PROCESSORS						
HHP01	Honey processor ID	Name and address or GLN of Honey processor that operates processing establishment	The Honey Co, 13 Honey Street, Manchester, MA14 2LP, England or n3+n13	x		
HHP02	Honey processor establishment ID	Name, address and registration number or GLN of processing establishment	The Honey Co, 13 Honey Street, Manchester, MA14 2LP, England or n3+n13	x		
HHP03	GMP certification	Names of quality or food safety GMP schemes by which Honey processor is certified				x
HHP04	Laboratory certification	Names of laboratory certification				x
FOR EACH UNIT PLASTIC SQUEEZERS						
Identities						
HHP05	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
HHP06	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (if received as a logistic unit)	List of n2+n14+AIs	x		
Source						
HHP07	Transporter ID	Name and address or GLN of transporter from whom the unit was received	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HHP08	Date and time of reception	Date and time of transfer from transporter	2009-06-28T08:30	x		
Control checks (related to the logistic or separate trade units, as appropriate)						
HHP09	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			X

Data element		*Description*	*Examples*	*Categorisation*		
				Shall	*Should*	*May*
Transformation information (for each trade unit)						
HHP10	Related created trade unit IDs	List of the GTIN+s of the created trade units that may incorporate part of the received trade unit	List of n2+n14+Ais	x		
FOR EACH UNIT PLASTIC SQUEEZER CAPS						
Identities						
HHP11	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
HHP12	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (if received as a logistic unit)	List of n2+n14+AIs	x		
Source						
HHP13	Transporter ID	Name and address or GLN of transporter from whom the unit was received	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HHP14	Date and time of reception	Date and time of transfer from transporter	2009-06-28T08:30	x		
Control checks (related to the logistic or separate trade units, as appropriate)						
HHP15	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			X
Transformation information (for each trade unit)						
HHP16	Related created trade unit IDs	List of the GTIN+s of the created trade units that may incorporate part of the received trade unit	List of n2+n14+Ais	x		
FOR EACH UNIT GLASS JARS						
Identities						
HHP17	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
HHP18	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (if received as a logistic unit)	List of n2+n14+AIs	x		
Source						
HHP19	Transporter ID	Name and address or GLN of transporter from whom the unit was received	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HHP20	Date and time of reception	Date and time of transfer from transporter	2009-06-28T08:30	x		
Control checks (related to the logistic or separate trade units, as appropriate)						
HHP21	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			x

Data element		*Description*	*Examples*	*Categorisation*		
				Shall	*Should*	*May*
Transformation information (for each trade unit)						
HHP22	Related created trade unit IDs	List of the GTIN+s of the created trade units that may incorporate part of the received trade unit	List of n2+n14+Ais	x		
FOR EACH UNIT OF GLASS JAR LIDS						
Identities						
HHP23	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
HHP24	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (if received as a logistic unit)	List of n2+n14+AIs	x		
Source						
HHP25	Transporter ID	Name and address or GLN of transporter from whom the unit was received	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HHP26	Date and time of reception	Date and time of transfer from transporter	2009-06-28T08:30	x		
Control checks (related to the logistic or separate trade units, as appropriate)						
HHP27	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			x
Transformation information (for each trade unit)						
HHP28	Related created trade unit IDs	List of the GTIN+s of the created trade units that may incorporate part of the received trade unit	List of n2+n14+Ais	x		
FOR EACH TRADE UNIT CREATED						
Identity						
HHP29	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
Description						
HHP30	Type of unit	Description of physical type of unit (number of glass jar/squeezers)	Six-pack	x		
HHP31	grams	Grams of product (g)	425g	x		
HHP32	Name/type of product	Descriptive name of product (Honey)	Honey	x		
HHP33	Product specification	Records of further details of product specification (quality and size grades, etc) are available in electronic form, on paper or not available	Paper			X

Data element		*Description*	*Examples*	*Categorisation*		
				Shall	*Should*	*May*
HHP34	Composition	List of names	Nutrients Energy Protein Carbohydrates fat	x		
HHP35	Date of durability	Best before or sell by date, as appropriate	Sell by 2008-06-30		x	
Production history						
HHP36	Process specification	Records of process specification are available in electronic form, on paper or not available	Paper			X
HHP37	Production line IDs	The business's own IDs of the particular production lines used	F3, P4			X
HHP38	Date and time of production	Time of packing/labelling at end of line	2009-06-28T11:30:46		x	
HHP39	HACCP	Records of HACCP analysis and critical control point checks are available in electronic form, on paper or not available	Paper			X
HHP40	Hygiene checks	Records of hygiene checks (date and testes) are available in electronic form, on paper or not available	Date: 2009-06-24 Paper			X
HHP41	Carbohydrates (sugars)	For information about the standardized analytical method see annex C.				X
HHP42	Water insoluble solids contents	For information about the standardized analytical method see annex C.				X
HHP43	Cane and maize syrups	For information about the standardized analytical method see annex C.				X
HHP44	Pollen	For information about the standardized analytical method see annex C.				X
HHP45	Hydroxy Methyl Furfurald (HMF)	For information about the standardized analytical method see annex C.				X
HHP46	Moisture	For information about the standardized analytical method see annex C.				X
HHP47	Colour	For information about the standardized analytical method see annex C.				X
HHP48	Texture	For information about the standardized analytical method see annex C.				x
HHP49	Smell	For information about the standardized analytical method see annex C.				x
HHP50	Taste	For information about the standardized analytical method see annex C.				x
HHP51	Enzyme activity	For information about the standardized analytical method see annex C.				X
HHP52	Diastase activity	For information about the standardized analytical method see annex C.				X
HHP53	Electric conductivity	For information about the standardized analytical method see annex C.				X
HHP54	Flumethrine	For information about the standardized analytical method see annex C.				x
HHP55	Tau-Fluvalinate	For information about the standardized analytical method see annex C.				x

Data element		*Description*	*Examples*	*Categorisation*		
				Shall	*Should*	*May*
HHP56	Oxalic Acid	For information about the standardized analytical method see annex C.				x
HHP57	Amitraze	For information about the standardized analytical method see annex C.				x
HHP58	Coumaphos	For information about the standardized analytical method see annex C.				x
HHP59	Cymiazole	For information about the standardized analytical method see annex C.				x
HHP60	Chloramphenicol	For information about the standardized analytical method see annex C.				x
HHP61	Nitrofurane metabolites	For information about the standardized analytical method see annex C.				x
HHP62	Streptomycin	For information about the standardized analytical method see annex C.				X
HHP63	Sulfonamides	For information about the standardized analytical method see annex C.				X
HHP64	Tetracyclines	For information about the standardized analytical method see annex C.				X
HHP65	Tylosin	For information about the standardized analytical method see annex C.				X
Transformation information						
HHP66	Related received trade unit IDs	List of the GTIN+s of the received trade units that may be input to the created trade unit	List of n2+n14+AIs	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
HHP¨67	Logistic unit ID	SSCC	n2+n18	x		
HHP68	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HHP69	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HHP70	Transporter ID	Name and address or GLN of the transporter to whom the unit is dispatched	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HHP71	Date and time of dispatch	Date and time of transfer to transporter	2009-06-29T16:00	x		

6.10 Transporters and storage holders

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *transporters and storage holders* are considered to be businesses that provide the service of transporting or storing goods. They may operate at various stages in distribution chains, transporting or storing raw materials or products. Transport may be by land, sea or air.

Transporters and storage holders do not break down or create trade units but may break down or create logistic units.

Table 8 Detailed information requirements for transporters and storage holders

Data element		Description	Examples	Categorisation		
				Shall	Should	May
TRANSPORTER OR STORER						
HTS01	trasporter business ID	Name and address or GLN of food business that operates transport vehicle or storage establishment	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HTS02	Transport vehicle or storage establishment ID	Nationality, name (if applicable) and registration number of vehicle or name, address and registration number of establishment, or GLN	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
FOR EACH UNIT RECEIVED						
Identities						
HTS03	Unit ID	SSCC if collected or received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
HTS04	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (required only if received as a logistic unit and it is to be broken down or transformed by the transporter or storer)	List of n2+n14+AIs	x		
Source						
HTS05	Previous food business ID	Name and address or GLN of food business from whom the unit was received (pre-form producers, cap producers, processors, etc.)	The Honey Co, 13 Honey Street, Manchester, MA14 2LP, England or n3+n13	x		
HTS06	Date and time of reception	Date and time of transfer from previous food business	2009-07-29T16:00	x		
HTS07	Place of collection	Name and address or GLN (this is required only for transporters)	The Honey Co, 13 Honey Street, Manchester, MA14 2LP, England or n3+n13	x		
FOR EACH NEW LOGISTIC UNIT PRODUCED BY TRANSPORTER OR STORER						
Identities						

Data element		Description	Examples	Categorisation		
				Shall	Should	May
HTS08	Logistic unit ID	SSCC	n2+n18	x		
HTS09	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
HTS10	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
HTS11	Next food business ID	Name and address or GLN of the food business to whom the unit is dispatched (transporter or processor, etc.)	B Bee and Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		
HTS12	Date and time of dispatch	Date and time of transfer to next food business	2005-07-29T20:00	x		
HTS13	Place of delivery	Name and address or GLN (this is required only for transporters)	B Bee and Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		

6.11 Wholesalers/retailers/supermarkets

This table contains only part of the information that should be recorded in each of the respective previous links. This table can serve as a skeleton for a recommendation/ad-hoc standard for the respective previous links, but then a proper sector-wide investigation and subsequent hearing process must take place, and that was beyond the scope of this project.

For the purposes of this document, *retailers and caterers* are considered to be suppliers to the public, not to other businesses. Retailers and caterers are encouraged to record information on their sales but the scope of this document does not extend to sale to the public.

Table 9 Detailed information requirements for retailers and caterers

Data element		Description	Examples	Categorisation		
				Shall	Should	May
RETAILER OR CATERER						
HRC01	Food business ID	Name and address or GLN of food business that operates retail or catering establishment	G Grocer and Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		
HRC02	Retail or caterer establishment ID	Name, address and registration number or GLN of retail or catering establishment	F. Cuisine and Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		
FOR EACH UNIT RECEIVED						
Identities						
HRC03	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
HRC04	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
Source						
HRC05	Previous food business ID	Name and address or GLN of food business from whom the unit was received (Processor, transporter, etc.)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
HRC06	Date and time of reception	Date and time of transfer from previous food business	2009-07-30T07:00	x		

7 Bibliography

GS1 (2007) GS1 General Specifications, version 7.1.

EC-178/02 (2002) Regulation (EC) No 178/2002 of the European parliament and of the counsil of 28 January 2002 laying down the gerneral principles and requirements of food law, establish the European Food Safety Authority and laying down procedures in matters of food safety., The European Parliament and the council of the European Union

NS-EN ISO 9001:2000, ISO 9001:2000 specifies requirements for a quality management system where an organization

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Singhal R.S., Kulkarni P.R., Rege D.V. (1997) Handbook of indices of food quality and authenticity, Woodhead Publishing, Cambridge.

Annex A
(informative)

The background to the development of the ad-hoc scheme

A.1 The need for traceability

There are increasing demands for traceability throughout the food chain. The root causes of many of the recent food safety problems have been found in the primary production sector, although the problems are manifested at the other end of the food chain in the products sold to consumers. Hence there are needs to trace back through the chain to determine the causes of the problems and then, in taking remedial action, to trace forward from those causes to withdraw or recall all the unsafe products produced. With chain traceability in place, these tasks can be done efficiently and with the minimum of commercial disturbance. Without chain traceability, whole sectors of the food industry may have to be closed down on a precautionary basis and the costs can be ruinous.

Legislators are now acting on traceability in order to protect the public. Food businesses, particularly the large retailers and those producing branded goods, are increasingly demanding traceability to assure their standards and to protect their businesses.

A.2 The legal requirements for traceability.

The EU Regulation on the General Principles and Requirements of Food Law came into effect 1st January 2005 (EC-178/02, 2002). Related EU food legislation will have to be adapted to these requirements by 1st January 2007 at latest.

In its article 3 this Regulation provides its own definition of traceability, in Article 18 it specifies traceability requirements and in Article 19 it specifies related product recall requirements:

Article 3

Other Definitions

(15) 'traceability' means the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution;

Article 18

Traceability

1. The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.

2. Food and feed business operators shall be able to identify any person from whom they have been supplied with a food, a feed, a food-producing animal, or any substance intended to be, or expected to be, incorporated into a food or feed.To this end, such operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand.
3. Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.
4. Food or feed which is placed on the market or is likely to be placed on the market in the Community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions.
5. Provisions for the purpose of applying the requirements of this Article in respect of specific sectors may be adopted in accordance with the procedures laid down in Article 58(2).

Article 19

Responsibilities for food: food business operators

1. If a food business operator considers or suspects that a food which it has imported, produced, processed, manufactured or distributed is not in compliance with the food safety requirements, it shall immediately initiate procedures to withdraw the food in question from the market and inform the competent authorities thereof. Where the product may have reached the consumer, the operator shall effectively and accurately inform the consumers of the reason for its withdrawal, and if necessary, recall from consumers products already supplied to them when other measures are not sufficient to achieve a high level of health protection.
2. A food business operator responsible for retail or distribution activities which do not affect the packaging, labelling, safety or integrity of the food shall, within the limits of its respective activities, initiate procedures to withdraw from the market products not in compliance with the food-safety requirements and shall participate in contributing to the safety of the food by passing on relevant information necessary to trace a food, cooperating in the action taken by producers, processors, manufacturers and/or the competent authorities.

The Regulation demands a one up, one down traceability system to be operated throughout food distribution chains. It requires the identification of food at all stages, not merely the lot marking after processing required by current legislation. Chain traceability, product withdrawal and recall are based on the sequential interrogation of the food businesses up or down the chain and are dependent on them responding and providing the necessary information to track the materials involved.

Annex B
(informative)

The philosophy of the ad-hoc scheme

B.1 The concept of traceability

ISO defines traceability as the ability to trace the history, application or location of that which is under consideration, and notes that when considering products this can relate to the origin of materials and parts and the processing history.

This is a more extensive definition than is stated in the EU General Food Law, with implications beyond that law's fundamental requirement to be able to trace the food through the various food businesses that handle it in the distribution chain. The information required may therefore include what the food is and what has happened to it, as well as where it has come from and who was responsible for it. These further aspects of traceability are important in relation to food safety, quality and labelling.

Traceability concerns only the *ability* to trace things, which means that the necessary information must be available when required. It does not mean that the information must at all times be *visible* by being labelled on the food or being with it.

B.2 The types of information required and their prioritisation

The types of information that may be required can be broadly categorised into:

- fundamental traceability information;
- specifically required information;
- and commercially desirable information.

Fundamental traceability information is information required to identify the food and trace its physical movement through the distribution chains. Essential parts of this information concerning the suppliers and destinations of food will, under the EU General Food Law, have to be held by each producer or food business and be made available to the competent authorities and to other producer or food business operators for the purpose of product withdrawal or recall. For each producer or food business, the fundamental information includes:

their own ID and location;
the quantities, nature and unit IDs of the food (including materials to be incorporated in food) received by the business;
the ID's of the previous producer/food businesses (from whom those units were received);
the dates/times and places of reception;
the quantities, nature and unit IDs of the food dispatched by the business;
the ID's of the next businesses (to whom those units are dispatched);
the dates/times and places of dispatch;

and the 'mapping' relationships between the units received and dispatched (when units are transformed by the business).

Note that when units are transformed by a business, the mapping relationship between the units received and the units dispatched need not be simple and direct. For example, a honey processor may use many units of glass jars, perhaps from different suppliers, to produce units of product. Each unit of product may possibly be associated with a number of units of glass jars, and vice versa. Traceability requires that the mapping relationship is known, not that it should be a simple 1:1 relationship.

Specifically required information is particular information on the nature of the food and on the circumstances of its production that is required by law for particular purposes, and which must be made available to the appropriate authorities or persons for those purposes. These requirements vary with national legislation and the type of food and food business.

Examples of specifically required information include:

- the results of chemical and bacterial analyses, etc, that are specifically required under food safety legislation or under the general obligation for the monitoring of critical control points, which must be held by the food businesses and be accessible by the food authority (and be directly supplied to the food authority in some instances);
- customs and excise and trading (financial) information that must be held by businesses and be supplied to the appropriate authorities for purposes such as taxation, etc.

Commercially desirable information is information on the nature of the food and on the circumstances of its production, which is sought by food businesses for a variety of reasons. These include maximising the efficiency of their own operations, limiting their own liabilities under product liability and safety legislation, assuring the safety and quality of their products, enabling accurate labelling and substantiating their marketing claims, etc. The requirements for this information do, of course, vary from business to business.

Examples of commercially desirable information include much of that already listed above and:

- details of raw materials, products, processes and controls that are required for reasons of business efficiency, product labelling and to ensure product safety and quality;
- information on the Good Manufacturing Practice (GMP) status of the food businesses involved in the chain that is required to ensure product safety and quality, etc.

Clearly there is a huge range of information of potential interest. Given the differences between countries in their specific legal requirements, the information specifications cannot itemise all the information that may possibly be required in every situation. Hence there is a need for prioritisation, with the aim of providing a generic basis for traceability. For this purpose, the information itemised in the documents is categorised as:

- fundamental information necessary to identify and physically trace the products, that shall be recorded;
- specific information that is required by law in relation to food safety, quality and labelling, together with important elements of commercially desirable information related to those matters, that should be recorded;
- further specific and commercial information considered to be of sufficient relevance to be included in the documents, that may be recorded.

Some areas of relevant information, such as the Hazard Analysis (and) Critical Control Point (HACCP) analyses and checks carried out by a business, are complex data sets that are individual to each product, process and business and so are difficult to standardise. To account for this, some flexibility is allowed in the specifications for businesses to record further information in their own non-standardised files but keyed to the units of food produced.

B.3 The units to be identified and traced

The physical units traded are those to be identified and traced.

An ID system that applies to the trade in goods of all types is already in operation throughout the world, under the auspices of Global Solutions One (GS1 2007). This system is widely used in the food industry.

The GS1 system defines a trade unit as any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in the supply chain, and adds this definition covers raw materials through to the end-user products and also includes services, all of them having pre-defined characteristics.

Trade units are marked with a *Global Trade Identification Number* (GTIN) which incorporates a code allocated by GS1to uniquely identify the company and another code allocated by the company to denote the item (usually indicating product type). Further data can be attributed to the item using *Application Identifiers* (AI's), commonly used to further describe the product (e.g. date of minimum durability) and to uniquely identify each particular trade unit. The production batch and item serial numbers, or simply the date and time of production, are often used to uniquely identify each trade unit. A further GS1 code, the *Global Location Number* (GLN), can be allocated by the company to identify particular locations.

However, goods are also transported or stored as *logistic units*, such as pallets, which contain a number of separately identified trade units. The trade units within a logistic unit may all be similar in type or they may be different, for example in a pallet of mixed products assembled by wholesaler to send to a retailer. Each logistic unit is marked with a *Serial Shipping Container Code* (SSCC) which uniquely identifies the company and the particular logistic unit.

These various GS1identifiers are usually expressed as standardised bar code labels on the units.

To achieve chain traceability, the business that creates each trade unit, whatever its form, must uniquely identify it with a GTIN plus a particular unit code (i.e. a GTIN+ in the terminology of this document). Businesses that transform trade units, such as processors who convert the units of raw materials received into the products dispatched, create new units and must give them new IDs. The relevant information for the traceability of the units is recorded by their creator and by the businesses that subsequently trade them physically through the distribution chain.

Similarly, businesses that assemble logistic units must identify each logistic unit with a SSCC and record the IDs of the trade units that make up each logistic unit. Businesses that transport, store or trade intact logistic units merely have to record the limited information related to those logistic units rather than their component trade units. However, distributors often transform logistic units or break them down to the separate trade units prior to dispatch. These businesses must also record the relationships mapping the trade units between the logistic units received and the units dispatched.

B.4 Dealing with the security, rights of access and supply of information

Clearly the businesses will not wish to make all this traceability information publicly available, particularly not to their competitors or even in many instances to their own suppliers and outlets. Even the fundamental traceability information has considerable commercial value, as

open access to it would reveal a business's suppliers, markets and trading patterns. Therefore, there is a need to consider the rights to information and the control of access to it.

The rights of the various authorities to the fundamental traceability and specifically required information are prescribed in law. Business operators have a right to some of the specifically required information that the law requires to be passed on. They will also have a legal right to relevant fundamental traceability information when engaged in withdrawal or recall procedures, but not otherwise. There are no rights to the commercially desirable information other than those agreed or contracted between trading partners.

However, in practice there is considerable and increasing commercial pressure to provide information. Trade with much of the corporate food industry is now subject to suppliers and distributors agreeing to quality assurance standards and traceability requirements, including the holding or the supply of the associated information. Multiple retailers even share relevant on-line sales information with major suppliers to facilitate just-in-time stock replenishment.

To achieve commercial acceptance, the information specifications are for the generation and holding of information, not for the dissemination of that information. The businesses remain, in effect, the owners of their information. The passing on of information, other than that prescribed by law, remains a matter of commercial policy or commercial agreement between businesses. The establishment of the information specifications will, of course, ensure that the necessary information is available, and the technical specification will facilitate the communication of the information when required.

The business solutions built on the specifications will require secure business to business handshaking protocols to ensure that only those with a legitimate reason can gain access, and then only to the particular information on the particular units to which they have a right.

A consequence of this is that the information desired by the trade to be visible at the various transaction points in the distribution chains will not necessarily be available, unless there are commercial arrangements for that information to be passed on through the chains from the businesses that generated it. It is strongly recommended that such arrangements are made, but that is not part of the scheme.

Annex C
(informative)

Standardized analytical methods

C.1 Data elements checks for product quality checks

In the following table information is given about data elements a link to the appropriate analytical method.

Table 10 Overview over the data elements for product quality checks

Code and name of data element		Method number	Page
HHP41	Carbohydrates (sugars	1	31
HHP42	Water insoluble solids content	2	31
HHP43	Cane and maize syrups	3	31
HHP44	Pollen	4	32
HHP45	Hydroxy Methyl Fururaldehyde (HMF)	5	32
HHP46	Moisture	6	32
HHP47	Colour	7	33
HHP48	Texture	8	33
HHP49	Smell	9	33
HHP50	Taste	10	34
HHP51	Enzyme activity	11	34
HHP52	Diastase activity	12	34
HHP53	Electric conductivity	13	35

C.2 Data elements checks for contaminant checks

In the following table information is given about data elements a link to the appropriate analytical method.

Table 11 Overview over the data elements for contaminant checks

Code and name of data element		Method number	Page
HHP54	Flumethrine	14	35
HHP55	Tau-Fluvalinate	14	35
HHP56	Oxalic Acid	15	36
HHP57	Amitraze	16	36
HHP58	Coumaphos	14	35
HHP59	Cymiazole	17	36
HHP60	Chloramphenicol	20	37
HHP61	Nitrofurane metabolites	23	38
HHP62	Streptomycin	19	37
HHP63	Sulfonamides	22	38
HHP64	Tetracyclines	21	38
HHP65	Tylosin	18	37

C.3 Analytical methods

In the following table information is given about methods of analysis in a standardised manner. The format of method of analysis and explanation of the headings is given in table 12.

Table 12 Explanation of items in standardized analytical methods

Method number	Number of all methods recorded within the ad-hoc standard
Method of analysis	Method name may include analyte and type of method
Category of method of analysis	Reference to official status of cooperating organisation
Parameter group	Main group of parameters like microbiological, chemical or others
Parameter	Analyte level
Legislative limit	Residual concentration allowed in e.g. EU directive of regulation
Monitoring	Subject to monitoring according to legislation
Literature reference	EU directive or published research reference of the method
Chemical Abstract Service	Registry number, a unique identifier to be used to search a number of data-retrieval systems
Cross reference	Method may also include references in other chapters/products

Various additions to this standardized table of analytical methods are possible, but this depends on the level of thoroughness of data required. The following items may be considered to include in the table:

- Applicability statement:
  - Limitations on use of method or other information
- Method performance:
  - Statistical information generated by collaborative study like, trueness %, precision % or limit of detection %
- Principle:
  - Scientific basis for the method of analysis
- Apparatus and reagents:
  - Specifications for necessary laboratory apparatus and reagent preparations
- Preparation of sample:
  - Description of method of analysis in several sections
- Calculation:
  - Description of final result of method of analysis

The following tables show the methods of analysis for the determination of presence of contaminants in samples of honey.

Method number 1

Method of analysis	HPLC, GC
Category of method of analysis	

Parameter group	Carbohydrates
Parameter	Fructose and glucose Sucrose
Legislative value	a. not less than 60g/100g b. Not more than 5 g/100g (in general)
Monitoring	

Literature reference	EU directive 2001/101/EC
Chemical Abstract Service	57-48-7 fructose 50-99-7 glucose 57-50-1 sucrose
Cross Reference	

Method number 2

Method of analysis	Filter method
Category of method of analysis	

Parameter group	Insoluble matter
Parameter	Water insoluble solids contents
Legislative value	Not more than 0,1g/100g (in general) Not more than 0,5g/100g (pressed honey)
Monitoring	To detect honey impurities

Literature reference	EU directive 2001/101/EC
Chemical Abstract Service	
Cross reference	

Method number 3

Method of analysis	Isotope ratio mass spectrometry (13C/12C ratio)
Category of method of analysis	

Parameter group	
Parameter	Cane and maize syrups
Legislative value	
Monitoring	To detect any form of adulteration

Literature reference	AOAC
Chemical Abstract Service	
Cross reference	

Method number 4

Method of analysis	Microscopy
Category of method of analysis	
Parameter group	Botanical
Parameter	Pollen
Legislative value	
Monitoring	
Literature reference	Moar, N.T. (1985) Pollen analysis of New Zealand honey. New Zealand Journal of Agricultural Research. 1985. vol. 28, 39-70
Chemical Abstract Service	
Cross reference	

Method number 5

Method of analysis	HPLC LD or UV, Winkler, Bisulfite White
Category of method of analysis	
Parameter group	Chemical
Parameter	Hydroxy Methyl furualdehyde (HMF)
Legislative value	a. not more than 40 mg/kg (in general, except baker's honey) (EU) b. not more than 80 mg/kg (honeys of declared origin from regions with tropical climate and blends of these honeys) (Codex)
Monitoring	
Literature reference	EU directive 2001/101/EC Codex Stan 12-1981
Chemical Abstract Service	67-47-0
Cross reference	

Method number 6

Method of analysis	Refractometry (Carl Fisher method)
Category of method of analysis	
Parameter group	
Parameter	Moisture
Legislative value	Not more than 20% (in general) Not more than 23% (heather and baker's honey in general) Not more than 25% (baker's honey from heather)
Monitoring	Quality criteria determines capability of honey to remain stable
Literature reference	EU directive 2001/101/EC
Chemical Abstract Service	
Cross reference	

Method number 7

Method of analysis	Spectrophotometry VIS photometer, Lovibond comparator or Lovibond color Pod, Hanne color analyser
Category of method of analysis	

Parameter group	Physical
Parameter	Colour
Legislative value	
Monitoring	

Literature reference	
Chemical Abstract Service	
Cross reference	

Method number 8

Method of analysis	Viscosity
Category of method of analysis	

Parameter group	Organoleptical
Parameter	Texture
Legislative value	
Monitoring	

Literature reference	Mendes, E. , et al. (1998). Quality evaluation of Portugese honey. Carbohydrate Polymers. Vol. 37, issue 3, nov. 1998, 219-223
Chemical Abstract Service	
Cross reference	

Method number 9

Method of analysis	
Category of method of analysis	

Parameter group	organoleptical
Parameter	smell
Legislative value	
Monitoring	

Literature reference	Mendes, E. , et al. (1998). Quality evaluation of Portugese honey. Carbohydrate Polymers. Vol. 37, issue 3, nov. 1998, 219-223
Chemical Abstract Service	
Cross reference	

Method number 10

Method of analysis	
Category of method of analysis	

Parameter group	Organoleptical
Parameter	Taste
Legislative value	
Monitoring	

Literature reference	Mendes, E. , et al. (1998). Quality evaluation of Portugese honey. Carbohydrate Polymers. Vol. 37, issue 3, nov. 1998, 219-223
Chemical Abstract Service	
Cross reference	

Method number 11

Method of analysis	Spectrophotometric measurement of 4-nitrophenol
Category of method of analysis	

Parameter group	
Parameter	Enzyme activity (invertase)
Legislative value	
Monitoring	Freshness indicator

Literature reference	SiegenthalerU., 1977. Eine einfache und rasche Methode zur Bestimmung der alpha-Glucosidase (Saccharase) im Homig, Mitt. *Gebiete Lebensm. Hyg.* **68**, pp. 251–258.
Chemical Abstract Service	
Cross Reference	

Method number 12

Method of analysis	Schade or Phadebas method
Category of method of analysis	

Parameter group	
Parameter	Diastase activity
Legislative value	a. Not less than 8 Schade units(in general, except baker's honey) b. Not less than 3 Schade units (honeys with low natural enzyme content and HMF content of not more than 15 mg/kg)
Monitoring	

Literature reference	EU directive 2001/101/EC
Chemical Abstract Service	
Cross reference	

Method number 13

Method of analysis	Conductimeter
Category of method of analysis	
Parameter group	
Parameter	Electrical conductivity
Legislative value	a. not more than 0,8 mS/cm (honey in general, except see legislation) b. not less than 0,8 mS/cm (honeydew and chestnut honey, except see legislation)
Monitoring	Depends on ash and acid content
Literature reference	EU directive 2001/101/EC
Chemical Abstract Service	
Cross reference	

Method number 14

Method of analysis	Liquid and Gas Chromatography (multi analysis), HPLC
Category of method of analysis	
Parameter group	Chemical (acaricides)
Parameter	a. Flumethrine (prohibited for bees) b. Tau-Fluvalinate (prohibited for bees) c. Coumaphos
Legislative value	a. zero b. zero c. 0.1 mg/kg
Monitoring	No EU legislation (possibility Directive 96/23/EC)
Literature reference	Regulation 2686/98/EC Regulation 2034/96/EC Regulation 1931/99/EC Martel AC, Zeggane S. Determination of acaracides in honey by high-performance liquid chromatography with photodiode array detection. J. Chromatogr.A 2002 Apr 19; 954 (1-2):173-80 Sanchez-Brunette C, Albereo B, Miguel E, Tadeo JL. Determination of insecticides in honey by matrix solid-phase dispersion and gaschromatography with nitrogen-phosphorus detection and mass spectrometric conformation. J. AOAC 2002 Jan-Feb; 85 (1):128-33 Korta E, Bakkali A, Berruetta LA, Gallio B, Vincente F. Study of an accelerated solvent extraction procedure for the determination of acaracide residues in honey by high-performance liquid chromatography-diode array detector. J.Food Prot. 2002 Jan;65(1):161-6 Menkissoglu-Spiroudi U; Diamantidis GC, Georgiou VE, Thrasyvoulou AT, Determination of malathion, coumafos and fluvalinate residues in honey by gas chromatography with nitrogen-posphorus or electron capture detectors. J.AOAC INT. 200 Jan-Feb; 83 (1): 178-82
Chemical Abstract Service	a. 69770-45-2 b. . 102851-06-9 c. 56-72-4
Cross reference	

Method number 15

Method of analysis	LC /GC
Category of method of analysis	

Parameter group	Acaracides
Parameter	Oxalic acid
Legislative value	Not yet established (see also EU regulation 2377/90 annex II)
Monitoring	

Literature reference	Regulation 546/2004/EC Moosbeckhofer, R. et al. 2003. Investigations on the oxalic acid content of honey from oxalic aced treated and untreated bee colonies
Chemical Abstract Service	144-62-7
Cross reference	

Method number 16

Method of analysis	Gas chromatography
Category of method of analysis	

Parameter group	Antibiotics (Formamidines)
Parameter	Amitraze
Legislative value	0.2 mg/kg
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

Literature reference	Regulation 3093/92; 1430/94; 1742/96; 1916/98; 1863/97; 2395/99; 1646/2004 Jimenez JJ, Nozal MJ, Bernakl JL, Santos M, Mayorga AL. Factors affecting the extraction, hydrolysis and derivation steps for the quantitation of total residues of amitraz in honey by gas chromatography with electron capture detection. Anal Bioanal Chem 2002 Sep; 37 (2):300-4. Epub 2002 Aug 27
Chemical Abstract Service	33089-61-1
Cross reference	

Method number 17

Method of analysis	Liquid chromatography
Category of method of analysis	

Parameter group	Anitbiotics (Iminopphenyl thiazlidine derivatives)
Parameter	Cymiazole
Legislative value	1 mg/kg
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

Literature reference	Regulation 2071/96; 1931/1999/EC Cabras P, Melis M, Spanedda L. Determination ofcymiazole residues in honey by liquid chromatography. J.AOAC Int. 1993 Jan-Feb; 76 (1):92-4
Chemical Abstract Service	61676-87-7
Cross reference	

Method number 18

Method of analysis	Liquid chromatography and mass spectrometry
Category of method of analysis	

Parameter group	Antibiotic substance (prohibited for bees)
Parameter	Tylosin
Legislative value	zero
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

	Regulation 1931/99
Literature reference	Nozal Nalda MJ, Bernal Yague JL, Gomez MT, Jimenez Sevilla JJ, Bernal del Nozal J, Higes Pascual M. Trace analysis of antibacterial tylosin A, B, C and D in honey by liquid chromatography-electrospray ionization-mass spectrometry. J Sep Sci. 2006 Feb;29(3):405-13
Chemical Abstract Service	1401-69-0
Cross reference	

Method number 19

Method of analysis	Liquid chromatography
Category of method of analysis	

Parameter group	Prohibited Antibiotics for bees (in EU)
Parameter	Streptomycin
Legislative value	Zero
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

	1140/96; 1530/2002
Literature reference	Edder, P. et al. 1999. Determination of streptomycin residues in food by solid phase extraction and liquid chromatography with post column derivatization and fluorometric detection. Journal of Chromatography. Vol. 830, 2, 345-351
Chemical Abstract Service	57-92-1
Cross reference	

Method number 20

Method of analysis	LC/MS/MS
Category of method of analysis	

Parameter group	Prohibited antibiotic
Parameter	Chloramphenicol
Legislative value	Zero
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

	Regulation 675/92; 1430/94
Literature reference	Ortelli, D. 2004. Analysis Chloramphenicol residues in honey by liquid chromatography tandem mass spectrometry. Chromatographia. 2004, 59, 61-64
Chemical Abstract Service	56-75-7
Cross reference	

Method number 21

Method of analysis	LC/MS/MS
Category of method of analysis	

Parameter group	Prohibited antibiotics for bees
Parameter	Tetracycline
Legislative value	zero
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

Literature reference	Regulation 3462/93; 281/96 Ishii, R. et al. 2006. Analysis of tetracyclines in honey and royal jelly by LC/MS/MS. Shokuhin Eiseigaku Zasshi. 2006. dec, 47(6): 277-83 (Japanese article)
Chemical Abstract Service	60-54-8
Cross reference	

Method number 22

Method of analysis	LC/MS/MS
Category of method of analysis	

Parameter group	Prohibited antibiotic for bees
Parameter	Sulfonamides (sulfanilamide)
Legislative value	zero
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

Literature reference	Regulation 675/92; 3426/93; 281/96 Huq, S. , K. Kallury. 2006. Extraction and analysis of sulfonamides from honey by LC/MS/MS using straat X-C polymeric SPE sorbent en Gemini C18 HPLC column. Appilcations SPE TN-012
Chemical Abstract Service	63-74-1
Cross reference	

Method number 23

Method of analysis	LC/MS/MS
Category of method of analysis	

Parameter group	Prohibited antibiotic
Parameter	Nitrofurane (nitrofurazone)
Legislative value	zero
Monitoring	No EU legislation on monitoring (possibility Directive 96/23/EC)

Literature reference	Regulation 2901/93 Khong, SP. et el. 2004. Analysis of matris bound nitrofuran residues in worldwide originated honeys by isotooe dilution LC/MS/MS. J. Agric. Food chem.. 52 (17) 5309-5315.
Chemical Abstract Service	59-87-0
Cross reference	

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