



Federal Office of
Consumer Protection
and Food Safety

Collaboration between BCH and EUginus

Daniela Wahler – 12th meeting BCH-IAC



European GMO initiative for a unified database system

Mission

provide reliable information for the detection and identification of genetically modified organisms (GMO → living modified organism (LMO))

Target audience

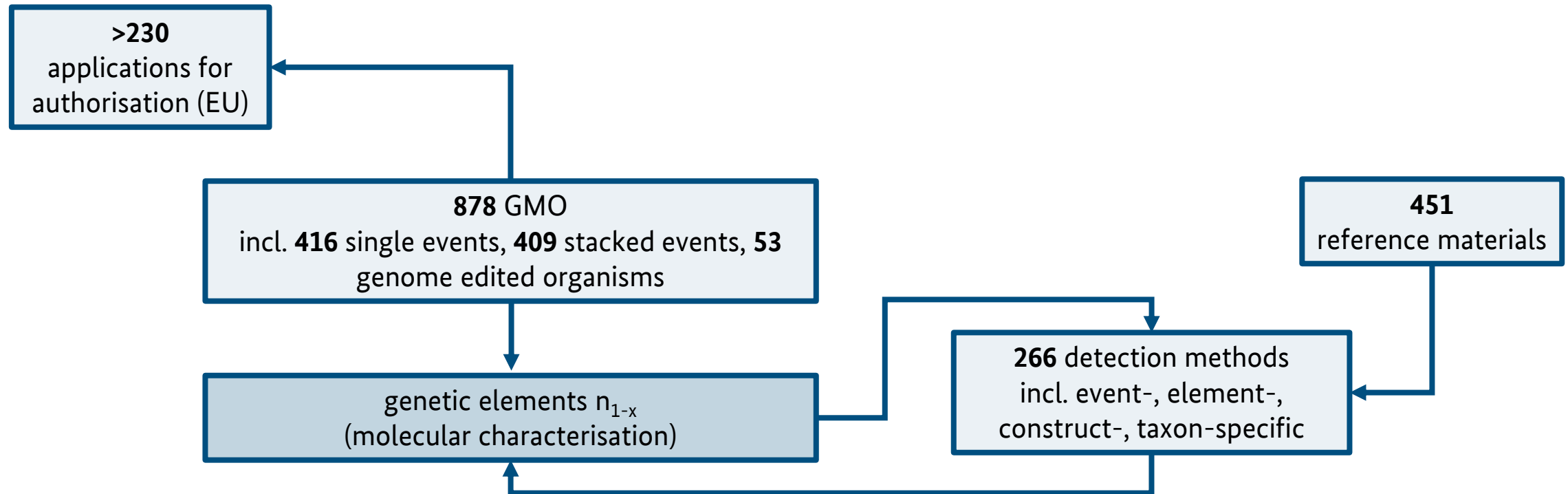
(official) laboratories for GMO control and detection as well as the interested public

www.euginius.eu

The screenshot shows the EUGINIUS website homepage. The header features the EUGINIUS logo and a navigation menu with links: Home, GMO, Detection, Analysis, Authorisation, Search, and Help. Below the header, the main content area is titled 'The European GMO database'. It includes an 'Overview' section with links to 'Release 1.9.4', 'News on (commercialised) genome-edited organisms', and 'EUGINIUS views' (876 GMOs (incl. stacks), 266 methods, 451 reference materials, Genetic elements, and GMO-related websites). The main text describes EUGINIUS as an initiative of BVL (Federal Office of Consumer Protection and Food Safety) and WFSR (Wageningen Food Safety Research). It states that EUGINIUS provides detailed information on the presence, detection, and identification of GMOs, with a focus on the European Union and world-wide coverage. It also mentions that EUGINIUS provides information about commercialised organisms and published ones with market-relevant traits, but does not contain an exhaustive list of organisms developed with NGTs. A section titled 'About the partners' lists the Federal Office of Consumer Protection and Food Safety (BVL) and Wageningen Food Safety Research (WFSR) as partners. At the bottom, logos for WAGENINGEN UNIVERSITY & RESEARCH, AGES, IMA, and the Federal Office of Consumer Protection and Food Safety are displayed.



EUginus in numbers (as of May 9th, 2023)





Collaboration with the BCH

How everything started

GMO genetic element thesaurus

- Need for harmonisation of terminology of genetic elements was identified
- Development of a thesaurus to unambiguously name genetic elements
- Joint publication in 2021 on GMO-GET

The general syntax for a genetic element is
XX-YYYY-ZZZZZ → e.g. CS-epsps-MAIZE

Adamse et al. BMC Bioinformatics (2021) 22:48
<https://doi.org/10.1186/s12859-020-03880-0>

BMC Bioinformatics

DATABASE

Open Access



GMO Genetic Elements Thesaurus (GMO-GET): a controlled vocabulary for the consensus designation of introduced or modified genetic elements in genetically modified organisms

Paulien Adamse^{1*}, Emilie Dagand², Karen Bohmert-Tatarev^{2,3}, Daniela Wahler², Manoela Miranda^{4,5}, Esther J. Kok¹ and Joachim Bendiek^{2,6}

*Correspondence:
paulien.adamse@wur.nl
¹ Wageningen Food Safety
Research (WFSR), PO Box 230,
6700 AE Wageningen,
Netherlands
Full list of author information
is available at the end of the
article

Abstract

Background: Various databases on genetically modified organisms (GMOs) exist, all with their specific focus to facilitate access to information needed for, e.g., the assistance in risk assessment, the development of detection and identification strategies or inspection and control activities. Each database has its unique approach towards the subject. Often these databases use different terminology to describe the GMOs. For adequate GMO addressing and identification and exchange of GMO-related information it is necessary to use commonly agreed upon concepts and terminology.

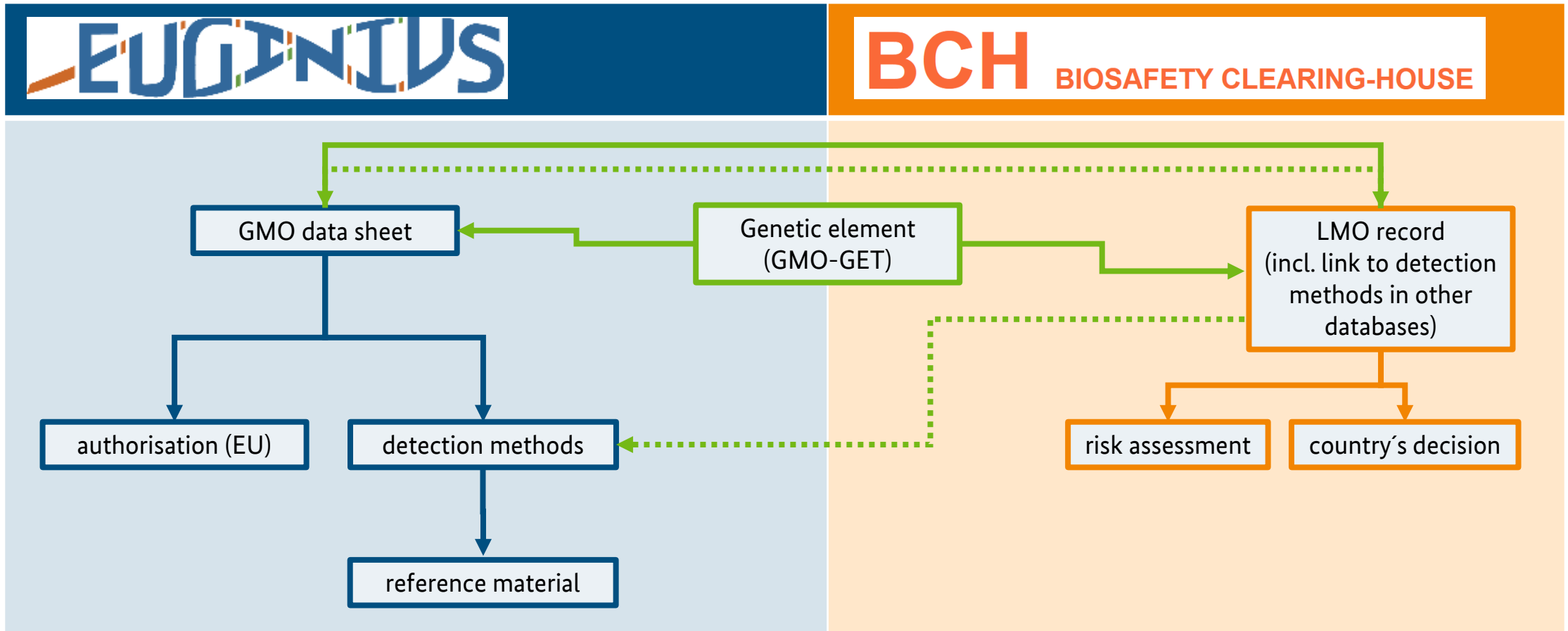
Result: A hierarchically structured controlled vocabulary describing the genetic elements inserted into conventional GMOs, and GMOs developed by the use of gen(om) e-editing is presented: the GMO genetic element thesaurus (GMO-GET). GMO-GET can be used for GMO-related documentation, including GMO-related databases. It has initially been developed on the basis of two GMO databases, i.e. the Biosafety Clearing-House and the Euginius database.

Conclusion: The use of GMO-GET will enable consistent and compatible information (harmonisation), also allowing an accurate exchange of information between the different data systems and thereby facilitating their interoperability. GMO-GET can also be used to describe genetic elements that are altered in organisms obtained through current targeted genome-editing techniques.

Keywords: GMO, Thesaurus, Vocabulary, Genetic elements, Genome-editing, Targeted mutagenesis



Here we are...





How does it look like in the databases? Where is the linkage?





Genetic Element	Add	Synonyms	Donor	Trait	Function	Definition	BCH
>P-Cauliflower mosaic virus	+	P-35S					
>P-2ocS_35S-SYNTH	+						
>P-35S-CaMV	+	P-35S, P-CaMV 35S	Cauliflower mosaic virus			Consists of four tandem repeats of activating sequence-1 (AS1, length: 21bp) (Lam and Chua 1990) and a single portion of the 35S promoter (Odel et al. 1985) both derived from Cauliflower mosaic virus (CaMV).	100287
>P-AAS1-CaMV	+	CaMV 35S promoter plus four repeats of activating sequence, P-AAS1	Cauliflower mosaic virus		Promoter (directs transcription). Leads to high levels of expression in roots.		101504
>P-35S-CaMV	+		Cauliflower mosaic virus		Promoter (directs transcription). This element contains promoter and leader for the Cauliflower mosaic virus (CaMV) 35S RNA containing a duplicated enhancer region which additionally stimulates the activity of this promoter in plants.	Cauliflower mosaic virus (CaMV) 35S promoter with duplicated enhancer region; inserted element length varies between e.g. 307bp/320bp/296bp/511bp/151bp; Kay R. et al. (1987) Science 236, 1299-1302	100366

GENETIC ELEMENT (GENE)

[BCH-GENE-SCBD-100366-6](#) | PDF | Print | Share | Compare

LAST UPDATED: 16 FEB 2021

General information

CaMV Enhanced 35S promoter

EN

Abbreviation

P-e35S-CaMV

EN

Category

Promoter

Records in the databases referencing the genetic element

List with GMOs and genetic elements

Define Filter Criteria

promoter > P-Cauliflower mosaic virus > P-e35S-CaMV x

By pressing the „show“ function of column „Genetic Elements“, all further elements contained by the filtered GMOs are displayed.

page 1 of 17 results per page: 20 | 100 | all 329 results

GMO	Genetic Elements show
ASR0368	promoter > P-Cauliflower m
BT10 potato	promoter > P-Cauliflower m
BT11 x MR162 x MR604 x MON89034	
BT11 x MR162 x MR604 x MON89034 x OA21	
BT11 x MR162 x MR604 x MON89034 x S307	
BT11 x MR162 x MR604 x MON89034 x S307 x	

Detection methods search result

Your search criterion is: (element target P-Cauliflower mosaic virus)

page 1 of 1 results per page: 20 | 100 | all 8 results

Name	Type	Target	Description
QL-ELE-00-001	element-specific	P-Cauliflower mosaic virus	Qualitative conventional PCR method for detection of Cauliflower mosaic virus 35S promoter (Official C according to § 64 LFGB, L 00 00-31)
QL-ELE-00-004	element-specific	P-Cauliflower mosaic virus	Qualitative conventional PCR method for detection of Cauliflower mosaic virus 35S promoter (Lipp et al
QL-ELE-00-005	element-specific	P-Cauliflower mosaic virus	Qualitative conventional PCR method for detection of Cauliflower mosaic virus 35S promoter (ISO/FDIS
QL-ELE-00-012	element-specific	E-35S-CaMV, P-Cauliflower mosaic virus, P-Acp1-SYNTH	Qualitative real-time PCR (TagMan) method for detection of Cauliflower mosaic virus 35S promoter (pa
QL-ELE-00-017	element-specific	P-Cauliflower mosaic virus	Part of the qualitative duplex real-time PCR (TagMan) method for detection of Cauliflower mosaic virus synthase terminator (ISO 21569 AMO1)

Living Modified Organism

Introduced or modified genetic element(s)

252

Page 1 of 11 « First < Prev 1 2 3 4 5 6 Next > Last » 1 - 25 of 252 Items per page 5

Title	UId	Updated on
Fertility restorer Indian mustard	BCH-LMO-SCBD-115910-2	18 Apr 2013 13:17

BioCassava Pro

Laboratory for detection and identification of LMOs

Genetic element(s) detectable by

MON-89034-3 x

Title	UId
LAB - Instituto de Innovación en Biotecnología e Industria (IIBI)	BCH-LAB-SCBD-250633
LAB - Sciensano	BCH-LAB-SCBD-250598
LAB - LABORATORIO CENTRAL DE VETERINARIA (LCV)	BCH-LAB-SCBD-250614



Where is the linkage? GMO <> LMO

GMO detailed information

GMO:	CTC93209-4
UID:	CTC-93209-4
Company:	Centro de Tecnologia Canaveira (CTC)
Developer:	Centro de Tecnologia Canaveira (CTC)
Species:	<i>Saccharum officinarum</i> (sugar cane, sugarcane)
Traits:	Pest/Disease resistance > Insect resistance > Lepidoptera resistance Selection markers and reporter genes > Kanamycin/neomycin resistance
EU authorisation:	

no Reference materials could be found
no Authorisations could be found
no Literature reference could be found

General Information

Description: The sugar cane event CTC93209 has been produced by *Agrobacterium*-mediated transformation with vector pCTC523. The vector carries two cassettes.

- The first cassette encodes the *cry1Ac* gene conferring resistance to *D. saccharalis*.
- The second cassette expresses the NptII protein used as a selection marker.

Real-time polymerase chain reaction and Southern blot analysis corroborate evidence of the integration of two intact T-DNAs without sequences related to the backbone of the plasmid.

Links regarding to this GMO: <http://www.isaaa.org/gmapprovaldatabase/event/default.asp?EventID=556>,
BCH <http://bch.cbd.int/database/record.shtml?documentid=115563>

Transformation / Modification technique: Agrobacterium-induced

BCH BIOSAFETY CLEARING-HOUSE

BCH-LMO-SCBD-115563-3 PDF | Print | Share | Compare | Edit | Close

LIVING MODIFIED ORGANISM (LMO)

[Decisions on the LMO](#) [Risk Assessments](#) PUBLISHED: 03 APR 2020 LAST UPDATED: 17 FEB 2022

Living Modified Organism identity

The image below identifies the LMO through its unique identifier, trade name and a link to this page of the BCH. Click on it to download a larger image on your computer. For help on how to use it go to the LMO quick-links page.



CTC-93209-4
Insect resistant sugarcane



Read barcode or type above URL into internet browser to access information on this LMO in the Biosafety Clearing-House © SCBD 2012
<https://bch.cbd.int/database/record?documentID=115563>

Name
Insect resistant sugarcane EN

Transformation event
CTC93209

Does this LMO have a unique identifier?
Yes

Unique identifier
CTC-93209-4

Developer(s)
- ORGANIZATION: CTC - CENTRO DE TECNOLOGIA CANAVEIRA | [BCH-CON-SCBD-243818-1](#)
ORGANIZATION:
CTC - Centro de Tecnologia Canaveira
Regional research institution association



Where is the linkage? Detection and identification methods for LMO



GMO detailed information

GMO: CTC93209-4
Alias:
UID: CTC-93209-4
Tradename:
Company: [Centro de Tecnologia Canavieira \(CTC\)](#)
Developer: Centro de Tecnologia Canavieira (CTC)
Species: *Saccharum officinarum* (sugar cane, sugarcane)
Traits: Pest/Disease resistance > Insect resistance > Lepidoptera resistance
Selection markers and reporter genes > Kanamycin/neomycin resistance
EU authorisation:

Detection Methods

5 results

Name	Type	Target	Description	Validation	Standardisation	Verification
QL-ELE-Cry1Ac-FIR/nd/Cry1AcR-02	element-specific	CS-cry1Ac-BACTU	Qualitative real-time PCR (TaqMan) method for detection of the cry1Ac gene (Scholtens et al., 2013).	in-house validation	none	1
QL-ELE-ncf 1-5/ncf 1-3'	element-specific	CS-nptII-ECOLX, V-nptII-ECOLX	Qualitative real-time PCR (TaqMan) method for detection of the nptII gene (Scholtens et al., 2013).	in-house validation	none	1
QL-ELE-00-002	element-specific	CS-nptII-ECOLX, V-nptII-ECOLX	Qualitative conventional PCR method for detection of neomycin phosphotransferase II gene (ISO 21569)	ring trial validation	ISO standard	1
QL-ELE-00-003	element-specific	CS-nptII-ECOLX, V-nptII-ECOLX	Qualitative conventional PCR method for detection of the neomycin phosphotransferase II gene (nptII) (BVL L 00 00 31, 2001)	ring trial validation	national standard	1
QL-ELE-00-016	element-specific	CS-cry1Ab-BACTU, CS-cry1Ab_1Ac-tr-SYNTH, CS-cry1Ac-BACTU	Qualitative real-time PCR (TaqMan) method for detection of the element coding for synthetic cry1Ab/Ac genes (ISO/TS 21569-6).	ring trial validation	ISO standard	1

Export to Excel

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LIVING MODIFIED ORGANISM (LMO)

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Name

Insect resistant sugarcane

EN

Transformation event

CTC93209

Detection method(s)

External link(s)

[EUGenius: GMO event CTC93209-4 \[English \]](#)

Additional Information

Other relevant website addresses and/or attached documents

[EUGenius: GMO event CTC93209-4 \[English \]](#)

[ISAAA: CTC93209-4 \[English \]](#)

[BR102020005666A2.pdf \[Portuguese \]](#)



Outlook



Current state:
as described

Midterm goal:
intensify data exchange

Long-term goal:
explore automated ways
for data exchange



Federal Office of
Consumer Protection
and Food Safety

Thank you for your attention!



Contact:

Dr. Daniela Wahler
Gerichtstr. 49, 13347 Berlin

405@bvl.bund.de | databasemanager@euginius.eu

