5. FEED CONSUMPTION DATABASE BASED ON A STANDARDISED FEED CLASSIFICATION SYSTEM

REAL-LIFE DATA FOR ANIMAL DIETARY EXPOSURE

***Ad hoc* meeting with GMO Industry Representatives**

25 March 2026

EUROPEAN FOOD SAFETY AUTHORITY

Overview of EFSA approaches for Animal Dietary Exposure

SCIENTIFIC REPORT

EFSA Journal

APPROVED: 22 October 2019

doi: 10.2903/j.efsa.2019.5896

Animal dietary exposure: overview of current approaches used at EFSA

European Food Safety Authority (EFSA),
Michele Ardizzone, Marco Binaglia, Bruce Cottrill, Jean-Pierre Cugier, Lucien Ferreira, Jose Ángel Gómez Ruiz, Matteo Innocenti, Sofia Ioannidou, Secundino López Puente, Caroline Merten, Marina Nikolic and Giovanni Savoini

Estimates of **ADE** are undertaken at EFSA **by several Panels/Units** for the risk assessment of:

- ❑ feed additives
- ❑ feed contaminants
- ❑ genetically modified feed
- ❑ pesticide residues in feed

Although appropriate within the respective regulatory frameworks, the **approaches and methodologies** used to estimate ADE **vary across the different risk assessment areas**.

Overview of EFSA approaches for Animal Dietary Exposure

The intended uses of ADE range from:

- **rough and conservative worst-case scenarios** covering the maximum daily exposure to a chemical (pesticide residues in feed).
- **more refined scenarios** aimed at assessing more representative exposures under standard-type diets (feed contaminants and GM feed).
- **intended inclusion levels** of a substance in commercial diets (e.g. feed additives).

Overview of EFSA approaches for Animal Dietary Exposure

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Lack of a comprehensive database representative of feed consumption for the **EU animal population.**

ADE based on **default values** for **heterogeneous selection of animal species and categories**, with important differences across units, for:

- ❑ animal body weight (BW)
- ❑ feed intake (FI)
- ❑ inclusion rates (IR) of feed materials in rations/diets

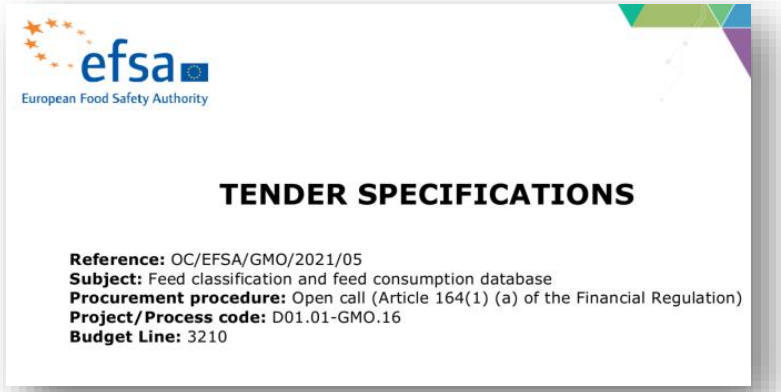
OECD guidance (OECD, 2009, 2013)
EFSA CONTAM Panel, 2011
EFSA FEEDAP Panel, 2017

EFSA GMO Panel 2023

To address this gap, EFSA launched a

Procurement to explore the **development of a feed consumption database based on a standardised feed classification system**.

Procurement OC/EFSA/GMO/2021/05 & Pinotti et al. 2024



efsa
European Food Safety Authority

TENDER SPECIFICATIONS

Reference: OC/EFSA/GMO/2021/05
Subject: Feed classification and feed consumption database
Procurement procedure: Open call (Article 164(1) (a) of the Financial Regulation)
Project/Process code: D01.01-GMO.16
Budget Line: 3210

External Scientific Report

UNIVERSITÀ DEGLI STUDI DI MILANO

APPROVED: 19 September 2024
doi: 10.2903/sp.efsa.2024.EN-9036

A proposal for the development of a feed consumption database using a standardised feed classification system

Pinotti L.[1], Pastorelli G.[1], Varese G.[2], Cheli F.[1], Di Lorenzo C.[3], Montanelli S.[2] Landolfi C.[4], Mangano G.[4], Gazerro C.[4], Perricone V.[1], Ottoboni M.[1], Moradei A.[1], Abbate R.[1], Luciano A.[1], Mercogliano F.[3]

[1] Department of Veterinary Medicine and Animal Sciences (DIVAS), University of Milan;
[2] Department of Computer Science "Giovanni degli Antoni", University of Milan;
[3] Department of Pharmacological and Biomolecular Sciences, University of Milan;
[4] ToxHub Srl.

The Procurement resulted in the External Scientific Report **Pinotti et al. 2024.**

Procurement to explore the **development of a feed consumption database based on a standardised feed classification system**.

- **Task 1:** mapping of existing **systems and methodologies for feed classification** and **feed consumption data collection.**
- **Task 2:** develop a proposal for **future update of the current EFSA food and feed classification system** (FoodEx2).
- **Task 3:** develop a proposal for a **feed consumption database**, including data structures and recommendations for data collection.
- **Task 4:** **proof of concept** for the development of a feed consumption database.

Task 1: *mapping of existing systems and methodologies for feed classification and feed consumption data collection*

Fundación española para el desarrollo de la nutrición animal (FEDNA)	Natural Resources Institute of Finland - Finnish feed tables (Luonnonvaratieto)
INRAE-CIRAD-AFZ (feed tables)	Dutch animal feed chain federation (CVB SYSTEM)
Feedipedia	The Swiss feed database (FeedBase)
The harmonised OECD tables of feedstuffs from field crops	International aquaculture feed formulation database (IAFFD)
Nordic feed evaluation system (NorFor)	The International Feed Vocabulary (FAO/UNDP)
Feed Register Materials *	The European Catalogue of Feed Materials

Evaluation included:

- ❑ Several **databases** or **classification systems**
- ❑ Individual **structure**, **terminology** and **description**

- ❑ **Lack of homogeneity** in terms of feed materials:
  - subdivision in groups, categories and subcategories
  - description and nomenclature
- ❑ **Lack of information** on inclusion rates in the rations and diets and consumption of feed materials
- ❑ **EU Catalogue of Feed Materials** is the most reputable and widely used within the legal framework for placing products on the market and for labelling purposes

Task 2: *proposal for future update of the current EFSA food and feed classification system (FoodEx2)*

European Catalogue of Feed Materials	**FEDNA**	**Feedipedia.org**	**FoodEx2**
1. *Cereal grains and products derived thereof*	1. Granos de cereales (cereal grains)	1. Forage plants	1. Cereal grains and products derived thereof (feed)
2. *Oil seeds, oil fruits, and products derived thereof*	2. Cereales procesados por calor (heat treated cereals)	2. Plant products/ by-products	2. Oil seeds, oil fruits, and products derived thereof (feed)
3. *Legume seeds and products derived thereof*	3. Subproductos de cereals (cereal by-products)	3. Feed of animal origin	3. Legume seeds and products derived thereof (feed)
4. *Tubers, roots, and products derived thereof*	4. Frutos y tubérculos. Melazas y vinazas (Fruits & tubers. Molasses & vinasses)	4. Other feeds	4. Tubers, roots and products derived thereof (feed)
5. *Other seeds and fruits, and products derived thereof*	5. Concentrados proteína vegetal (vegetal protein concentrates)		5. Other seeds and fruits, and products derived thereof (feed)
6. *Forage and roughage, and products derived thereof*	6. Alimentos fibrosos (fibrous feeds)		6. Forages and roughage, and products derived thereof (feed)
7. *Other plants, algae and products derived thereof*	7. Concentrados de proteína animal (animal protein concentrates)		7. Other plants, algae and products derived thereof (feed)
8. *Milk products and products derived thereof*	8. Productos lácteos (dairy procucts)		8. Milk products and products derived thereof (feed)
9. *Land animal products and products derived thereof*	9. Grasas y aceites (fats and oils)		9. Land animal products and products derived thereof (feed)
10. *Fish, other aquatic animals and products derived thereof*	10. Minerales (minerals)		10. Fish, other aquatic animals and products derived thereof (feed)
11. *Minerals and products derived thereof*	11. Microingredientes (microingredients)		11. Minerals and products derived thereof (feed)
12. *Products and by-products obtained by fermentation using micro-organism, inactivated resulting in absence of live micro-organisms*			12. Fermentation (by-) products from microorganism the cells of which have been inactivated or killed (feed)
13. *Miscellaneous.*			13. Miscellaneous (feed)
			14. Compound feed (feed)

Hierarchical structure of **FoodEx2** closely aligns with the **EU Catalogue of Feed Materials,** however, further alignment is recommended.

Proposals for additions/updates of the FoodEx2 catalogue, e.g:

- ❑ **FEDNA "ID"** of the corresponding item in the FEDNA database
- ❑ **link to corresponding item** in the Feedipedia database
- ❑ ***termExtendedName*** to align the item name with the one used in the EU Catalogue of Feed Materials
- ❑ ***termScopeNote*** to align the item description with the one used in the EU Catalogue of Feed Materials
- ❑ ***commonNames*** to store all the alternative names for a specific item

Task 3: *proposal for a feed consumption database, including data structures and recommendations for data collection*

ORANIMAL CODE	ANIMAL DESC	GENDER	WEIGHT	MWEIGHT	TOTALDAILY INTAKE	SPECIAL CON	SPEC DIET	COUNTRY	AREA	COMMENTS ANIMAL
Piglet9	Piglet	G3	9	X1	0.50	C1	D1	IT	Southern Europe	Pastorelli et al, 2022

ORFEEDCODE	ORFEEDNAME	ENFEEDNAME	FOODEXCODE	COMMENTSFEED
R01.I01	Farina di mais	Corn meal	A07XG	

RECORD IDENTIFIER	ORANIMAL CODE	FOODEXR CODE	AMOUNT RECIPE	ORFEED CODE	IR	AMOUNT	BRAND
Piglet9_1	Piglet9	A0BT6	0.50	R01.I01	29.00	0.1450	

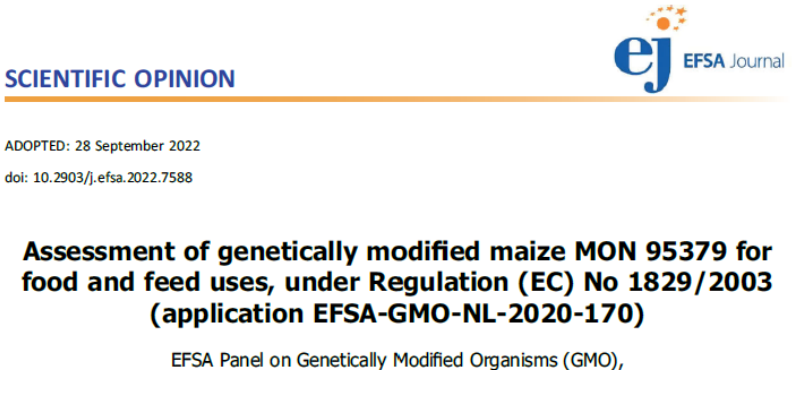
A **feed consumption database model** was created, consisting of 3 different data sheets:

- ❑ **Animal**
- ❑ **Feed**
- ❑ **Consumption**

The model was populated by feed consumption data obtained using FAO **"Global Livestock Environmental Assessment Model – interactive GLEAM-i"** along with the **selected scientific literature**

This highlighted the **lack of comprehensive and real-life feed consumption data** and the importance of **collaborating with stakeholders and the feed industry** to collect such data

Task 4: *proof of concept for the development of a feed consumption database*


SCIENTIFIC OPINION

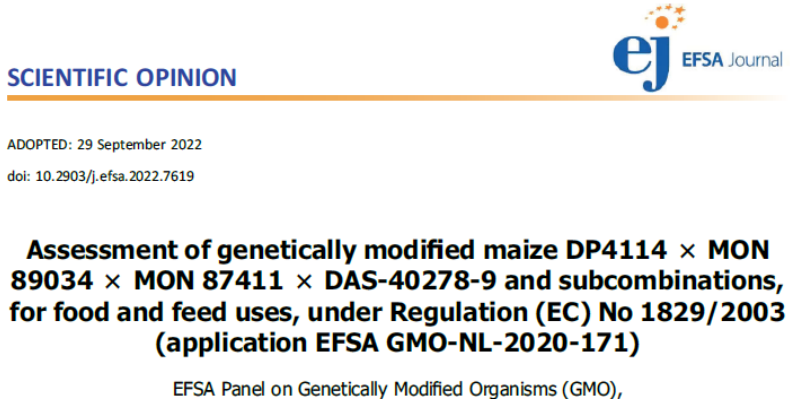
EFSA Journal

ADOPTED: 28 September 2022

doi: 10.2903/j.efsa.2022.7588

Assessment of genetically modified maize MON 95379 for food and feed uses, under Regulation (EC) No 1829/2003 (application EFSA-GMO-NL-2020-170)

EFSA Panel on Genetically Modified Organisms (GMO),


SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 29 September 2022

doi: 10.2903/j.efsa.2022.7619

Assessment of genetically modified maize DP4114 × MON 89034 × MON 87411 × DAS-40278-9 and subcombinations, for food and feed uses, under Regulation (EC) No 1829/2003 (application EFSA GMO-NL-2020-171)

EFSA Panel on Genetically Modified Organisms (GMO),


SCIENTIFIC OPINION

efsa JOURNAL

ADOPTED: 27 September 2023

doi: 10.2903/j.efsa.2023.8375

Risks for animal health related to the presence of ochratoxin A (OTA) in feed

EFSA Panel on Contaminants in the Food Chain (CONTAM),

two case studies were conducted, to evaluate feasibility and limitations of the feed consumption database model

- ADE to **NEPs** in GM crops and to **Contaminant (OTA)** were compared as reported in EFSA opinions, obtained using EFSA's Excel calculators and using data extracted from the model database
- **Data extracted from the model database showed**:
  - lower ADE estimations (more marked in the GMO examples)
  - some exceptions (higher ADE estimation) for Atlantic salmon (NEPs) or some animal categories (OTA)

Overall conclusions

Table 26: Main weaknesses and recommendations

Category	Weaknesses	Recommendations
Feed Materials	Differences among databases and classification systems	Define a complete list of feed materials by aligning the FoodEx2 feed hierarchy with any updated version of the EU Catalogue of Feed Material
	Limited feed materials in the proposed model database[3]	Include the defined and harmonised feed materials in the future feed consumption database with an open-ended option
	Limited feed recipe in the proposed model database[3]	Include a feed recipe database
Animals	Lack of harmonised nomenclature across different risk assessment areas	Harmonise nomenclature of food-producing and non-food-producing animals, starting from those listed in the EFSA current approaches for animal dietary exposure (EFSA, 2019)
	Limited animal categories in the proposed model database[3]	Include the harmonised list of food-producing and non-food-producing animals in the future feed consumption database
Feed Consumption Data	Absence of a reference feed consumption database recognized by the scientific community	Develop a web application for survey data collection, with pre-entered harmonised lists of feed ingredients and animals
	Limited real-life animal consumption data available	Collect data consumption information from the industry, stakeholders, nutritionists, breeders and farmers
	Consumption data from the literature in the proposed model database[3]	Include the real-life data consumption in the future feed consumption database

No common database are available to predict feed intake for farmed and companion animals

Different approaches rely on **different sources for default values** for BW, TDI of feed and IR of feedstuffs

To enable **more realistic** exposure assessments and **more accurate and harmonised** risk assessments:

- ❑ Collect **real-life data on feed consumption** from stakeholders, industry, nutritionists, breeders, and farmers
- ❑ Develop a **comprehensive feed consumption database** for a selected and harmonised list of food producing and non-food producing animals

Key message for the applicant meeting

Mandatory requirement

NEPs (IR 503/2013)

- ❑ Independent from a hazard
- ❑ EFSA GMO Panel (2023) applicable

ADE

Essential element of risk characterisation

NEPs or endogenous compounds

- ❑ Dependent from a hazard
- ❑ EFSA GMO Panel (2023) partially applicable*

Comparative dietary exposure

NEPs or endogenous compounds

- ❑ Levels comparison between GM & CC feeds
- ❑ Supporting History of Safe Consumption

Pinotti et al 2018

- ❑ **does not** introduce **new requirements** for ADE in GM plant risk assessment
- ❑ **shows** potential **weaknesses** in case ADE has to be refined for:
  - ❑ risk characterisation
  - ❑ comparative dietary exposure

* *The GMO Panel is aware that refined exposure estimates might be required on a case-by-case basis (e.g. if specific hazards are identified) for further risk characterisation; however, this scenario is not covered by the present document (EFSA GMO Panel 2023).*

Thanks for your attention

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