

Joint dossiers on food enzymes from animal and plant sources

General principle and Critical issues

EFSA FIP Unit – Food Enzyme Team



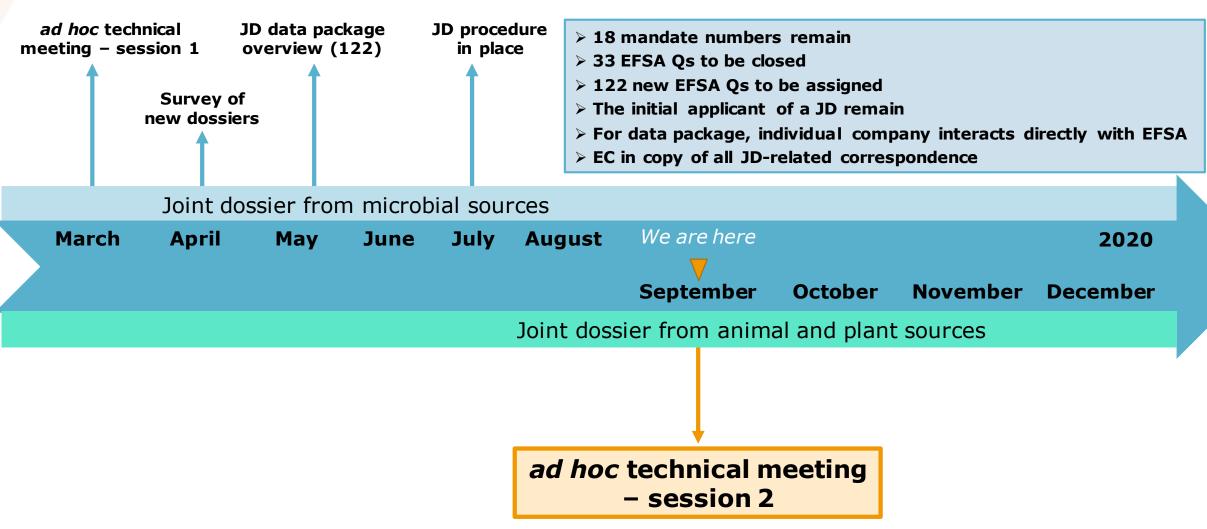
Joint Dossier Session 2



Time	No	Agenda Item	
9:00	1	Welcome and introduction - tour de table	
9:10	2	General principles and critical issues	
9:20	3	Joint dossiers from plant sources – Papain	
10:10	4	Joint dossiers from animal sources – Lysozyme	
11:00	5	Coffee break	
11:10	6	Joint dossiers from animal sources – Rennet	
12:00	7	Joint dossiers from animal sources – Triacylglycerol lipase	
12:50	8	Q & A	
13:00	9	Adjourn	

Joint Dossier Recap





Critical Issues in Food Enzyme Risk Assessment European Food Safety Authority (Source: EFSA guidance, 2009) SOURCE **ANIMALS PLANTS Basidiomycetes** Micro-organisms ☐ The **potential virulence/toxicity** of the producer organism/micro-organism, ☐ The possibility of **infectious agents** in the source, ■ Measures for their control in the food enzyme ☐ The enzyme protein(s) as well as other constituents, e.g., by-products originating from the source organism and residues of any substances and materials used in the production process ☐ **Intended and unintended reaction products** resulting either from enzymatic or chemical reactions of the food enzyme with food constituents or from the degradation of the food enzyme during storage and processing of the foodstuff ☐ The dietary exposure of the consumer - the residual concentration of the food enzyme(s) and other constituents of the food enzyme in the foods at the time of consumption and the amount and

frequency of their consumption

Food Enzyme Risk Assessment scheme



Production organism

- Taxonomy & intrinsic safety concern
- Genetic modification & introduced elements



Manufacturing process

 Raw materials, fermentation/extraction, purification, concentration, etc.



Food enzyme specification

- Biochemical composition (TOS)
- Chemical reaction, pH and Temp, stability, etc.
- Purity
- Suitability of the tox batch



Toxicology

- Are tox tests needed?
- In vitro bacterial reverse mutation test
- In vitro mammalian cell micronucleus test
- Repeated dose 90-day oral toxicity study in rodents

Intended conditions of use

- Food processes harmonisation with EC doc
- Transfer and removal of FE-TOS in foods



Dietary exposure

- Is calculation needed?
- If yes, use maximum use level for all dossiers



EFSA safety conclusion

Any toxicological concern to use the FE under the intended conditions of use?



Allergenicity

The enzyme itself

- Compounds from the source organism
- Compounds from the manufacturing process

Production from animal sources





- i. Which animal tissue is used for production, history of previous consumption of the tissue, a documented history of use with absence of human health adverse effects; information whether the animal tissue is fit for human consumption or derives from a Cat. 3 Animal By-Product (Regulation (EC) 1774/2002 as amended).
- ii. Whether animal tissues comply with meat inspection requirements and are handled in accordance with good hygienic practice.
- iii. Methods used to ensure the absence of any risk of infectivity (e.g. the agent of TSEs, parasites or other zoonotic agents).
- iv. Data on non-infectivity, supplied based on the classification of the tissues in terms of their infectious titre in natural diseases (WHO, 2003).

Production from plant sources



i. The part(s) of the plant used for the production of the food enzyme should be specified.



ii. Information on previous consumption, a documented history of safe use.

iii. Methods used for ensuring absence of substances that might cause adverse health effects to humans. For any residue of such substances remaining in the food enzyme, the name and amount should be specified and limits should be proposed.

iv. If a GM plant is used, information on the organism in accordance with the Guidance document of GMO Panel for the Risk Assessment of GM Plants and Derived Food and Feed (EFSA, 2006). If the source is already covered by an authorisation in accordance with Regulation (EC) No 1829/2003 on GM food and feed, information concerning the risk assessment and authorisation of the GMO should be provided.

Waiving of toxicological studies



Commission Implementing Regulation (EU) No 562/2012

Explanation to the Article

- (4) With regard to the toxicological properties of enzyme preparations, the SCF guidelines indicated that <u>food</u> <u>enzymes</u> which are <u>derived from edible parts</u> of (non-genetically modified) <u>plants and animals are generally considered as posing no health problems</u>. According to the guidelines no special documentation for safety needs to be supplied provided that <u>the potential consumption under normal use does not lead to an intake of any components which is <u>larger</u> than can be expected from <u>normal consumption of the source as such,</u> and provided that <u>satisfactory chemical and microbiological specifications can be established</u>.</u>
- (5) The European Food Safety Authority ("the Authority") has also indicated in its guidance on data requirements for the evaluation of food enzyme applications that the <u>justification for not supplying toxicological data</u> for food enzymes from edible parts of animals and non genetically modified plants may include <u>a documented history on the safety of the source of the food enzymes</u>, the <u>composition and the properties of the food enzyme</u> as well as its use in food which demonstrates <u>no adverse effects on human health when consumed in a comparable way</u>, supported by any <u>existing toxicological studies</u>. Therefore, the enzyme application for food enzymes from such edible sources should not be required to include toxicological data.

TOXICOLOGICAL DATA (EFSA, 2009; EFSA, 2014; Regulation (EU) No 562/2012 of 27 June 2012 amending Commission Regulation (EU) No 234/2011 with regard to specific data required for risk assessment of food enzymes. OJ L 168/21, 28.06.2012, p. 21-23).



WHEN TOXICOLOGICAL TESTING MAY NOT BE NEEDED



- ☐ A documented history on the safety of the source of the food enzyme
- □ the composition and the properties of the food enzymes, its use in food, demonstrating no adverse effects on human health when consumed in a comparable way, supported by any existing toxicological studies, e.g. edible parts of animals, non-GM plants
- (4) With regard to the toxicological properties of enzyme preparations, the Scientific Committee on Food (SCF) guidelines indicated that food enzymes which are derived from edible parts of (non-GM) plants and animals are generally considered as posing no health problems. According to the guidelines no special documentation for safety needs to be supplied provided that the potential consumption under normal use does not lead to an intake of any components which is larger than can be expected from normal consumption of the source as such, and provided that satisfactory chemical and microbiological specifications can be established.
- (5) The EFSA has also indicated in its guidance on data requirements for the evaluation of food enzyme applications that the justification for not supplying toxicological data for food enzymes from edible parts of animals and non genetically modified plants may include a documented history on the safety of the source of the food enzymes, the composition and the properties of the food enzyme as well as its use in food which demonstrates no adverse effects on human health when consumed in a comparable way, supported by any existing toxicological studies. Therefore, the enzyme application for food enzymes from such edible sources should not be required to include toxicological data.

"consumed in a comparable way"



Two sets of intake estimate - in a nutshell - data driven

Intake of food enzyme - TOS from processed foods

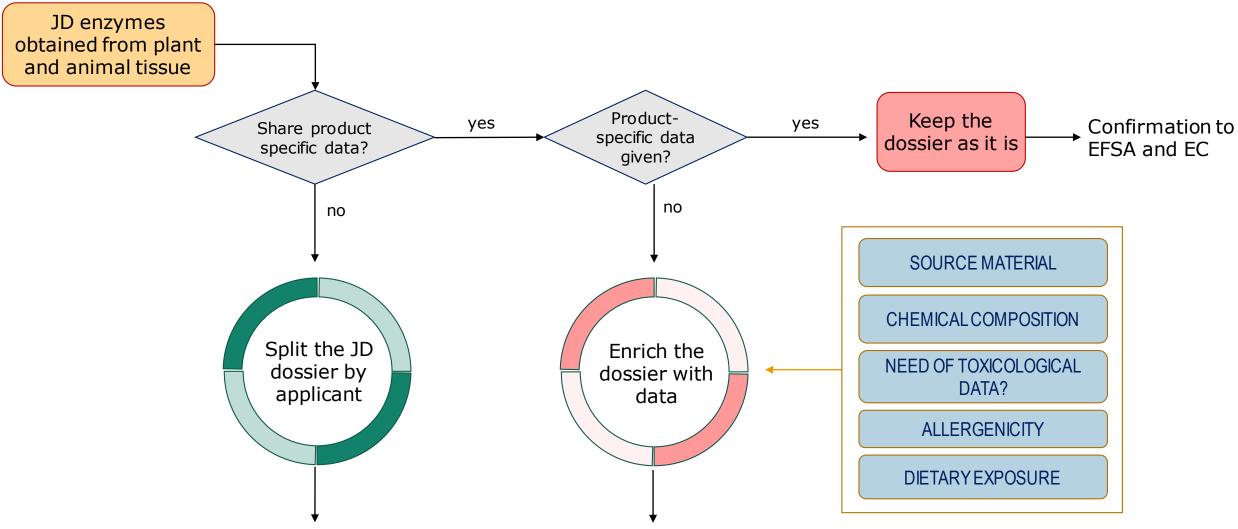
Intake of plant components from foods

Concentration data	TOS in raw material (e.g. barley grain)	Comparable portion of e.g. barley grain	
Data source	Dossier	Edibility from literature, recipe, etc	
Food coverage	Foods produced from intended processes	Foods containing or produced from barley	
Assessment Method	EFSA comprehensive Database (Individual food consumption data, six age groups)		
Food selection	FoodEx nomenclature / original food descriptor / food labels / recipes/ expert knowledge		
Factors needed	Conversion of food groups to raw material, or food ingredients to raw material		
Source of factors	 Open call-for-data* FAO technical conversion factor (e.g. from grain to malt) Cooking recipes (e.g. blood sausage) Ingredient list (e.g. 9% wholegrain barley in muesli) Instruction of beverage preparation (e.g. 25g of powder in 200 ml of milk) 	Dossier specific ■ Enzyme yield factor	

^{*} to ensure transparency, consistency and equal treatment

Proposed Way Forward





Follow the established procedure

Send the updated technical dossier to EFSA



Thank you for your attention!

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