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Safety and efficacy of FSF10000 and FLF1000 (3-phytase) as a feed additive for turkeys for fattening or reared for breeding, pigs for fattening and minor porcine species

EFSA Panel on Additives and Products or Substances used in Animal Feed (FEEDAP), Vasileios Bampidis, Giovanna Azimonti, Maria de Lourdes Bastos, Henrik Christensen, Birgit Dusemund, Mojca Kos Durjava, Maryline Kouba, Marta López-Alonso, Secundino López Puente, Francesca Marcon, Baltasar Mayo, Alena Pechová, Mariana Petkova, Fernando Ramos, Yolanda Sanz, Roberto Edoardo Villa, Ruud Woutersen and Montserrat Anguita

Abstract

Following a request from the European Commission, the Panel on Additives and Products or Substances used in Animal Feed (FEEDAP) was asked to deliver a scientific opinion on the safety and efficacy of 3-phytase FLF1000 and FSF10000 as a feed additive for turkeys for fattening or reared for breeding, pigs for fattening and minor porcine species for growing. This additive contains 3-phytase produced by a genetically modified strain of *Komagataella phaffii* and it is authorised in the EU as a feed additive for feed for chickens for fattening, laying hens, chickens reared for laying and for minor poultry species for fattening or reared for laying/breeding. The applicant requested the extension of use of the additive (both forms) to turkeys for fattening or reared for breeding purposes, and the assessment of the solid formulation to be used in pigs for fattening and minor porcine species for growing. The FEEDAP Panel concluded based on previously evaluated data that the additive, in either form, is safe for turkeys for fattening or reared for breeding at the maximum recommended level of 1,000 FTU/kg feed. However, due to lack of data the Panel could not conclude on the safety for pigs for fattening or minor growing porcine species. The FEEDAP Panel concludes that the use of the additive under the proposed conditions of use is safe for the consumer and the environment. Both forms of the additive are not irritant to eyes and skin but should be considered a potential respiratory sensitiser. The liquid formulation is not a dermal sensitiser but the solid formulation is. The Panel also considered based on previously evaluated data that the additive has a potential to be efficacious as a zootechnical additive in turkeys for fattening and reared for breeding and in pigs for fattening and minor growing porcine species at 500 FTU/kg feed.

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Requestor: European Commission

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Correspondence: feedap@efsa.europa.eu

Panel members: Giovanna Azimonti, Vasileios Bampidis Maria de Lourdes Bastos, Henrik Christensen, Birgit Dusemund, Mojca Kos Durjava, Maryline Kouba, Marta López-Alonso, Secundino López Puente, Francesca Marcon, Baltasar Mayo, Alena Pechová, Mariana Petkova, Fernando Ramos, Yolanda Sanz, Roberto Edoardo Villa and Ruud Woutersen.

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1. Introduction

1.1. Background and Terms of Reference

Regulation (EC) No 1831/2003¹ establishes the rules governing the Community authorisation of additives for use in animal nutrition. In particular, Article 4(1) of that Regulation lays down that any person seeking authorisation for a feed additive or for a new use of a feed additive shall submit an application in accordance with Article 7.

The European Commission received a request from Fertinagro Biotech S.L.² for authorisation of the product FSF10000 and FLF1000 (3-phytase), when used as a feed additive for turkeys for fattening or reared for breeding, pigs for fattening and minor porcine species (category: zootechnical additive; functional groups: digestibility enhancers and substances which favourably affect the environment).

According to Article 7(1) of Regulation (EC) No 1831/2003, the Commission forwarded the application to the European Food Safety Authority (EFSA) as an application under Article 4(1) (authorisation of a feed additive or new use of a feed additive). EFSA received directly from the applicant the technical dossier in support of this application. The particulars and documents in support of the application were considered valid by EFSA as of 4 October 2019.

According to Article 8 of Regulation (EC) No 1831/2003, EFSA, after verifying the particulars and documents submitted by the applicant, shall undertake an assessment in order to determine whether the feed additive complies with the conditions laid down in Article 5. EFSA shall deliver an opinion on the safety for the target animals, consumer, user and the environment and on the efficacy of the product FSF10000 and FLF1000 (3-phytase), when used under the proposed conditions of use (see Section 3.1).

1.2. Additional information

The additive 3-phytase FLF1000 is a liquid product that contains 3-phytase (Enzyme Commission number 3.2.1.8) produced by a genetically modified strain of *Komagataella phaffii* (CECT 13094)³ and is authorised as a feed additive for chickens for fattening and laying hens,⁴ for chickens reared for laying and minor poultry species for fattening or reared for laying or for breeding.⁵ The product is also authorised in the solid form (FLF10000) for the same species/categories.⁶

The FEEDAP Panel adopted an opinion on the safety and efficacy of the additive 3-phytase FLF1000 (liquid formulation) as a feed additive for chickens for fattening and laying hens (EFSA FEEDAP Panel, 2016), one on the extension of use in chickens for fattening and minor poultry species (EFSA FEEDAP Panel, 2018a) and another one on the use of this formulation in pigs for fattening (EFSA FEEDAP Panel, 2019b). The Panel also evaluated the safety and efficacy of the solid formulation of the additive (3-phytase FSF10000) for poultry species (EFSA FEEDAP Panel, 2019a; not including turkeys or pigs).

The applicant has now requested for the authorisation of the solid formulation (FSF10000) to be used in feed for pigs for fattening and minor porcine species and for the authorisation and the solid and liquid formulations (FSF10000 and FLF1000) in turkeys for fattening or reared for breeding.

¹ Regulation (EC) No 1831/2003 of the European Parliament and of the Council of 22 September 2003 on additives for use in animal nutrition. OJ L 268, 18.10.2003, p. 29.

² Fertinagro Biotech S.L., polígono industrial la Paz, parcela 185, 44195 Teruel, Spain.

³ Formerly classified as *Komagataella pastoris*. The accession number for the strain presented in the mandate referred to the recipient strain and not to the production strain which is (CECT 13094).

⁴ Commission implementing Regulation (EU) 2017/895 of 24 May 2017 concerning the authorisation of a preparation of 3-phytase produced by *Komagataella pastoris* (CECT 13094) as a feed additive for chickens for fattening and laying hens (holder of authorisation Fertinagro 0014 SL). OJ L 138, 25.5.2017, p.120.

⁵ Commission implementing Regulation (EU) 2019/144 of 28 January 2019 concerning the authorisation of a preparation of 3-phytase produced by *Komagataella pastoris* (CECT 13094) as a feed additive for chickens reared for laying and minor poultry species for fattening or reared for laying or for breeding (holder of authorisation Fertinagro Biotech S.L.). OJ L 27, 31.1.2019, p.8.

⁶ Commission implementing Regulation (EU) 2019/781 of 15 May 2019 concerning the authorisation of a preparation of 3-phytase produced by *Komagataella phaffii* (CECT 13094) as a feed additive for chickens for fattening or reared for laying, laying hens and minor poultry species for fattening, for breeding and reared for laying (holder of authorisation Fertinagro Nutrientes S.L.). OJ L 127, 16.5.2019, p.1.

2. Data and methodologies

2.1. Data

The present assessment is based on data submitted by the applicant in the form of a technical dossier⁷ in support of the authorisation request for the use of FSF10000 and FLF1000 as a feed additive.

The FEEDAP Panel used the data provided by the applicant together with data from other sources, such as previous risk assessments by EFSA.

The European Union Reference Laboratory (EURL) considered that the conclusions and recommendations reached in the previous assessment regarding the methods used for the control of the active substance in animal feed are valid and applicable for the current application.⁸

2.2. Methodologies

The approach followed by the FEEDAP Panel to assess the safety and the efficacy of FSF10000 and FLF1000 (3-phytase) is in line with the principles laid down in Regulation (EC) No 429/2008⁹ and the relevant guidance documents: Guidance on the assessment of the safety of feed additives for the target species (EFSA FEEDAP Panel, 2017) and Guidance on the assessment of the efficacy of feed additives (EFSA FEEDAP Panel, 2018b).

3. Assessment

The additives FSF10000 and FLF1000 are preparations of 3-phytase (Enzyme Commission number 3.1.3.8) produced by a genetically modified strain of *K. phaffii* (CECT 13094). This assessment deals with a request from the applicant to extend the use of the solid formulation of the additive (FSF10000), to pigs for fattening and minor porcine species and the extension of use of both solid and liquid formulations (FSF10000 and FLF1000) to turkeys for fattening and reared for breeding (except for breeding purposes) as a zootechnical additive (functional groups: digestibility enhancers and substances which favourably affect the environment).

3.1. Characterisation

In previous opinions, the Panel assessed the two formulations of the additive and its manufacturing process including the production strain and its genetic modification (EFSA FEEDAP Panel, 2016, 2019a). The applicant has not provided new information in this regard and the previous information on the characterization of the additive is still valid. The liquid formulation ensures a minimum phytase activity of 1,000 FTU/mL and the solid one of 10,000 FTU/g additive and they are proposed to be used in feed for pigs for fattening and minor porcine species and in turkeys for fattening and reared for breeding up to the point of lay at a minimum recommended level of 500 FTU/kg feed and a maximum recommended level of 1,000 FTU/kg feed.

3.2. Safety

Safety aspects regarding the use of this additive in feed including the safety of the production strain, [REDACTED]

[REDACTED] the safety for the consumer, for the users and for the environment have been previously evaluated (EFSA FEEDAP Panel, 2016, 2019a). The FEEDAP Panel concluded that there are no concerns regarding the genetic modification of the production strain, that there are no concerns for the consumer safety and no risks for the environment are expected from the use of the product as a feed additive. Regarding the safety for the user, it was concluded that the additive in either form is not irritant to eyes and skin. The liquid formulation is not a dermal sensitiser but the solid formulation is. The additive in either form should be considered a potential respiratory sensitiser.

⁷ FEED dossier reference: FAD-2019-0041.

⁸ The full report is available on the EURL website: <https://ec.europa.eu/jrc/sites/jrcsh/files/finrep-fad-2017-0043-3-phytase.pdf>

⁹ Commission Regulation (EC) No 429/2008 of 25 April 2008 on detailed rules for the implementation of Regulation (EC) No 1831/2003 of the European Parliament and of the Council as regards the preparation and the presentation of applications and the assessment and the authorization of feed additives. OJ L 133, 22.5.2008, p. 1.

The Panel is not aware of any new information that would lead it to reconsider the conclusions drawn previously. Moreover, the FEEDAP Panel considers that the new uses requested by the applicant would not modify the above conclusions. However, the safety for the new target species needs to be considered.

In a previous opinion, the FEEDAP Panel evaluated the safety of the additive (FLF1000) as a feed additive for chickens for fattening (EFSA FEEDAP Panel, 2016). From the results, the FEEDAP Panel concluded that the use of the liquid formulation is safe for chickens for fattening at 1,000 FTU/kg feed, with a margin of safety of 10. The FEEDAP Panel considers that this conclusion applies to the two formulations of the additive and that it can be extrapolated to turkeys for fattening or reared for breeding purposes.

For pigs for fattening, the applicant has provided the same tolerance trial in weaned piglets that was evaluated by the FEEDAP Panel in 2019 (EFSA FEEDAP Panel, 2019b). Data on the total feed intake of the animals under study was not provided and due to this limitation the Panel could not conclude on the safety for FLF1000 for pigs for fattening. In the absence of new data, the Panel cannot reconsider the conclusion previously drawn and cannot conclude on the safety for pigs for fattening or minor growing porcine species.

3.3. Efficacy

In previous evaluations (EFSA FEEDAP Panel, 2016, 2019a,b), the FEEDAP Panel assessed efficacy studies with the liquid formulation in chickens and pigs for fattening. From the data provided, the FEEDAP Panel concluded that the additive has a potential to be efficacious in chickens and pigs for fattening at 500 FTU/kg feed. The two formulations (liquid and solid) are considered to be equivalent with regard to the efficacy. Therefore, the Panel considers that the efficacy shown in pigs for fattening with the liquid formulation can be extended to the solid one and extrapolated to minor growing porcine species. Considering that the mode of action is well-known and similar between the different poultry species the Panel extrapolates the conclusion from chickens for fattening to turkeys for fattening or reared for breeding.

3.4. Post-market monitoring

The FEEDAP Panel considers that there is no need for specific requirements for a post-market monitoring plan other than those established in the Feed Hygiene Regulation¹⁰ and Good Manufacturing Practice.

4. Conclusions

The FEEDAP Panel concludes that the additive, in either form, is safe for turkeys for fattening or reared for breeding at the maximum recommended level of 1,000 FTU/kg feed. However, due to lack of data, the Panel cannot conclude on the safety for pigs for fattening or minor growing porcine species.

The FEEDAP Panel concludes that use of the additive under the proposed conditions of use is safe for the consumer and the environment. Both forms of the additive are not irritant to eyes and skin but should be considered a potential respiratory sensitiser. The liquid formulation is not a dermal sensitiser but the solid formulation is.

The Panel also considers that the additive has a potential to be efficacious as a zootechnical additive in turkeys for fattening or reared for breeding and in pigs for fattening and minor growing porcine species at 500 FTU/kg feed.

Documentation as provided to EFSA/Chronology

Date	Event
11/06/2019	Dossier received by EFSA. Preparations of 3-phytase for pigs for fattening, minor porcine species and turkeys for fattening/reared for breeding purposes. Submitted by Fertinagro Nutrientes S.L.
28/06/2019	Reception mandate from the European Commission
04/10/2019	Application validated by EFSA – Start of the scientific assessment
04/01/2020	Comments received from Member States
28/01/2020	Opinion adopted by the FEEDAP Panel. End of the Scientific assessment

¹⁰ Regulation (EC) No 1831/2003 of the European Parliament and of the Council of 22 September 2003 laying down requirements for feed hygiene. OJ L 35, 8.2.2005, p. 1.

References

- EFSA FEEDAP Panel (EFSA Panel on Additives and Products or Substances used in Animal Feed), Rychen G, Aquilina G, Azimonti G, Bampidis V, Bastos ML, Bories G, Chesson A, Flachowsky G, Gropp J, Kolar B, Kouba M, López Puente S, López-Alonso M, Mantovani A, Mayo B, Ramos F, Saarela M, Villa RE, Wallace RJ, Wester P, Brantom P, Dierick N, Herman L, Glandorf B, Kärenlampi S, Aguilera J, Anguita M and Cocconcilli PS, 2016. Scientific opinion on the safety and efficacy of 3-phytase FLF1000 as feed additive for chickens for fattening and laying hens. *EFSA Journal* 2016;14(11):4622, 15 pp. <https://doi.org/10.2903/j.efsa.2016.4622>
- EFSA FEEDAP Panel (EFSA Panel on Additives and Products or Substances used in Animal Feed), Rychen G, Aquilina G, Azimonti G, Bampidis V, Bastos ML, Bories G, Chesson A, Cocconcilli PS, Flachowsky G, Gropp J, Kolar B, Kouba M, López-Alonso M, López Puente S, Mantovani A, Mayo B, Ramos F, Saarela M, Villa RE, Wallace RJ, Wester P, Anguita M, Galobart J, Innocenti ML and Martino L, 2017. Guidance on the assessment of the safety of feed additives for the target species. *EFSA Journal* 2017;15(10):5021, 19 pp. <https://doi.org/10.2903/j.efsa.2017.5021>
- EFSA FEEDAP Panel (EFSA Panel on Additives and Products or Substances used in Animal Feed), 2018a. Scientific Opinion on the safety and efficacy of 3-phytase FLF1000 as a feed additive for chickens reared for laying and minor poultry species. *EFSA Journal* 2018a;16(3):5203, 6 pp. <https://doi.org/10.2903/j.efsa.2018.5203>
- EFSA FEEDAP Panel (EFSA Panel on Additives and Products or Substances used in Animal Feed), Rychen G, Aquilina G, Azimonti G, Bampidis V, Bastos ML, Bories G, Chesson A, Cocconcilli PS, Flachowsky G, Gropp J, Kolar B, Kouba M, López-Alonso M, López Puente S, Mantovani A, Mayo B, Ramos F, Saarela M, Villa RE, Wallace RJ, Wester P, Anguita M, Galobart J, Innocenti ML and Martino L, 2018b. Guidance on the assessment of the efficacy of feed additives. *EFSA Journal* 2018b;16(5):5274, 25 pp. <https://doi.org/10.2903/j.efsa.2018.5274>
- EFSA FEEDAP Panel (EFSA Panel on Additives and Products or Substances used in Animal Feed), 2019a. Scientific Opinion on the safety and efficacy of 3-phytase FSF10000 as a feed additive for chickens for fattening or reared for laying, laying hens and minor poultry species. *EFSA Journal* 2019a;17(1):5543, 10 pp. <https://doi.org/10.2903/j.efsa.2019.5543>
- EFSA FEEDAP Panel (EFSA Panel on Additives and Products or Substances used in Animal Feed), Bampidis V, Azimonti G, Bastos ML, Christensen H, Dusemund B, Kouba M, Kos Durjava M, López-Alonso M, López Puente S, Marcon F, Mayo B, Pechová A, Petkova M, Ramos F, Sanz Y, Villa RE, Woutersen R and Anguita M, 2019b. Scientific opinion on the safety and efficacy of 3-phytase FLF1000 as a feed additive for pigs for fattening and minor porcine species for growing. *EFSA Journal* 2019;17(8):5791, 8 pp. <https://doi.org/10.2903/j.efsa.2019.5791>

Abbreviations

- EURL European Union Reference Laboratory
FEEDAP EFSA Panel on Additives and Products or Substances used in Animal Feed