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Evaluation Report on the Analytical Methods submitted in connection with the Application for Authorisation of a Feed Additive according to Regulation (EC) No 1831/2003

Bacillus subtilis ABS1781

(FAD-2019-0086; CRL/190050)

European Union Reference Laboratory
Feed Additives

Evaluation Report on the Analytical Methods submitted in connection with the Application for Authorisation of a Feed Additive according to Regulation (EC) No 1831/2003

Dossier related to:	**FAD-190086 - CRL/190050**
Name of Product:	***Bacillus subtilis ABS1781***
Active Agent (s):	**Bacillus subtilis ABS1781**
Rapporteur Laboratory:	**European Union Reference Laboratory for Feed Additives (EURL-FA)** **JRC Geel, Belgium**
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Report checked by: Date:	**Zigmas Ezerskis** **10/06/2020**
Report approved by: Date:	**Christoph von Holst** **11/06/2020**

EXECUTIVE SUMMARY

In the current application an authorisation is sought under Article 4(1) for *Bacillus subtilis* ABS1781 under the category / functional group 4(b) 'zootechnical additives' / 'gut flora stabilisers', according to Annex I of Regulation (EC) No 1831/2003. The authorisation is sought for the use of the *feed additive* for all growing poultry species.

According to the Applicant, the *feed additive* contains as *active substance* viable spores of the non-genetically modified strain *Bacillus subtilis* ABS1781. The *feed additive* is to be marketed as a dry preparation containing a minimum content of *active substance* of $1x10^{11}$ Colony Forming Unit (CFU)/g and to be used directly in *feedingstuffs* or through *premixtures* at a minimum dose of $1.5x10^{5}$ CFU/g complete *feedingstuffs*.

For the identification of *Bacillus subtilis* ABS1781, the EURL recommends for official control Pulsed Field Gel Electrophoresis (PFGE), a generally recognised methodology for the genetic identification of bacterial strains.

For the enumeration of *Bacillus subtilis* ABS1781 in the *feed additive*, *premixtures* and *feedingstuffs*, the Applicant submitted a pour plate count method, which was single-laboratory validated and further verified. However, the EURL is aware of the ring-trial validated spread plate EN 15784 method developed to enumerate and differentiate spores of several *Bacillus* spp. Furthermore, the Applicant confirmed, upon request of the EURL, the suitability of the EN 15784 method for this product.

Based on the performance characteristics reported and the applicability statement provided by the Applicant, the EURL recommends the ring-trial validated EN 15784 method for official control for the enumeration of *Bacillus subtilis* ABS1781 in the *feed additive*, *premixtures* and *feedingstuffs*.

Further testing or validation of the methods to be performed through the consortium of National Reference Laboratories as specified by Article 10 (Commission Regulation (EC) No 378/2005), as last amended by Regulation (EU) 2015/1761) is not considered necessary.

KEYWORDS

Bacillus subtilis ABS1781, zootechnical additives, gut flora stabilisers, chickens and turkeys for fattening, turkeys reared for breeding, chickens reared for laying and minor growing poultry species.

1. BACKGROUND

In the current application an authorisation is sought under Article 4(1) (new feed additive) for *Bacillus subtilis* ABS1781 under the category / functional group 4(b) 'zootechnical additives' / 'gut flora stabilisers', according to Annex I of Regulation (EC) No 1831/2003 [1].

The authorisation is sought for the use of the *feed additive* for chickens for fattening, turkeys for fattening, chickens reared for laying, turkeys reared for breeding and minor poultry species [1,2,3].

According to the Applicant, the *feed additive* contains as *active substance* viable spores of the non-genetically modified strain *Bacillus subtilis* ABS1781 [4]. The strain is deposited at the Agricultural Research Culture Collection (NRRL, Peoria, Il, USA) under the deposit number NRRL B-67259 [5]. The *feed additive* is to be marketed as a dry preparation containing a minimum content of *active substance* of $1x10^{11}$ Colony Forming Unit (CFU)/g [6].

The *feed additive* is intended to be used directly in *feedingstuffs* or through *premixtures* at a minimum dose of $1.5x10^{5}$ CFU/g complete *feedingstuffs* [3].

Note: The EURL previously evaluated the analytical methods for the determination of *Bacillus subtilis* in the frame of several dossiers (e.g. FADs: 2017-0058; 2019-0009; 2019-0044) [7].

2. TERMS OF REFERENCE

In accordance with Article 5 of Regulation (EC) No 378/2005, as last amended by Regulation (EU) 2015/1761, on detailed rules for the implementation of Regulation (EC) No 1831/2003 of the European Parliament and of the Council as regards the duties and the tasks of the European Union Reference Laboratory concerning applications for authorisations of feed additives, the EURL is requested to submit a full evaluation report to the European Food Safety Authority for each application or group of applications. For this particular dossier, the methods of analysis submitted in connection with *Bacillus subtilis* ABS1781 and their suitability to be used for official controls in the frame of the authorisation were evaluated.

3. EVALUATION

Description of the analytical methods for the determination of the active substance in the feed additive, premixtures, feedingstuffs and when appropriate water (section 2.6.1 of the dossier - Annex II of Commission Regulation (EC) No 429/2008)

For the enumeration of *Bacillus subtilis* ABS1781 in the *feed additive*, *premixtures* and *feedingstuffs*, the Applicant submitted a pour plate count method, which was single-laboratory validated and further verified for the *feed additive* [8] and *feedingstuffs* [9].

According to the Applicant, an initial suspension of the sample is prepared in 0.1 % aqueous peptone solution and heat-treated at 61 °C for 35 min (heat treatment is omitted for pelleted feeds). Decimal dilutions are prepared from this initial suspension, pour plated with Tryptone Soya Agar (TSA) and incubated aerobically at 32 °C for 18 to 48 h.

Table 1 presents the performance characteristics re-calculated by the EURL [10] from the experimental data reported by the Applicant in the frame of the validation and verification studies [8, 9].

However, the EURL is aware of a ring-trial validated spread plate EN 15784 method [11] developed to enumerate and differentiate spores of several *Bacillus* spp. in *feed matrices* that was already evaluated and recommended by the EURL in the frame of previous *Bacillus subtilis* dossiers [7].

According to the EN 15784 method, 20 g of the *feed additive* (or 50 g of *premixtures* or *feedingstuffs*) are suspended in a phosphate buffered saline (or in 0.2 % sodium hydroxide solution for *premixtures* or *feedingstuffs*). From this suspension, one new dilution is prepared with "Polysorbate 80" peptone salt solution and heat-treated at 80 °C for 10 min. Further decimal dilutions are prepared from the heat treated suspension, spread plated on tryptone soya agar and incubated at 37 °C for 16-24 h aerobically. The following performance characteristics were reported from the validation study after logarithmic transformation of the CFU values [11]:

- a *repeatability* standard deviation (S_r) ranging from 0.07 to 0.09 $\log_{10}$ CFU/g and
- a *reproducibility* standard deviation (S_R) ranging from 0.32 to 0.35 $\log_{10}$ CFU/g

In addition, the EURL calculated according to ISO 7218 a limit of quantification (LOQ) of $3x10^4$ CFU/g [12].

Furthermore, the Applicant confirmed, upon request of the EURL, the applicability of the EN 15784 method to its product.

Table 1: Performance characteristics of the analytical of the Applicant's method for the determination of *Bacillus subtilis* ABS1781 in the *feed additive* (FA) [9] and *feedingstuffs* (FS) [10]

Matrix	Bacterial Counts (CFU/g)		S_r (log_{10} CFU/g)		S_{ip} (log_{10} CFU/g)	
	Val*	Ver*	Val*	Ver*	Val*	Ver*
FA	1.1×10^{11}	2.2×10^{11}	0.03	0.03	0.03	0.03
FS	7.0×10^{9}	5.5×10^{9}	0.07	0.10	0.09	0.16

S_r: standard deviation for repeatability; S_{ip} standard deviation for intermediate precision; Val: Validation; Ver: verification.
*Calculated by EURL from [9] and [10].

Based on the performance characteristics reported and the applicability statement from the Applicant, the EURL recommends for official control the ring-trial validated EN 15784 method for the enumeration of *Bacillus subtilis* ABS1781 in the *feed additive*, *premixtures* and *feedingstuffs*.

Note: The EN 15784 method is not applicable to *mineral feeds* composed mainly of minerals and containing at least 40 % crude ash. For these matrices laboratories may consider using the ring-trial validated VDLUFA method 28.2.2 instead [13].

Methods of analysis for the determination of the residues of the additive in food (section 2.6.2 of the dossier - Annex II of Commission Regulation (EC) No 429/2008)

An evaluation of corresponding methods of analysis is not relevant for the present application.

Identification/Characterisation of the feed additive (section 2.6.3 of the dossier - Annex II of Commission Regulation (EC) No 429/2008)

For the identification of *Bacillus subtilis* ABS1781, the Applicant developed a single nucleotide polymorphism (SNP) method [4].

The EURL recommends instead for official control Pulsed Field Gel Electrophoresis (PFGE), a generally recognised methodology for the genetic identification of bacterial strains [14]. This methodology for bacterial identification of authorised additives at a strain level is currently being evaluated by the CEN Technical Committee 327 to become a European Standard. Further testing or validation of the methods to be performed through the consortium of National Reference Laboratories as specified by Article 10 (Commission Regulation (EC) No 378/2005), as last amended by Regulation (EU) 2015/1761 is not considered necessary.

4. CONCLUSIONS AND RECOMMENDATIONS

In the frame of this authorisation, the EURL recommends for the official control Pulsed Field Gel Electrophoresis (PFGE) for the identification of *Bacillus subtilis* ABS1781, and the EN 15784 method for the enumeration of *Bacillus subtilis* ABS1781 in the *feed additive*, *premixtures* and *feedingstuffs*.

Note: The method EN 15784 is not applicable to mineral feeds composed mainly of minerals and containing at least 40 % crude ash. For these matrices laboratories may consider using the ring-trial validated VDLUFA method 28.2.2 instead.

Recommended text for the register entry (analytical method)

- Identification: Pulsed Field Gel Electrophoresis (PFGE)
- Enumeration in the *feed additive*, *premixtures* and *feedingstuffs*: Spread plate method on tryptone soya agar (EN 15784)

5. DOCUMENTATION AND SAMPLES PROVIDED TO EURL

In accordance with the requirements of Regulation (EC) No 1831/2003, reference samples of *Bacillus subtilis* ABS1781 have been sent to the European Union Reference Laboratory for Feed Additives. The dossier has been made available to the EURL by EFSA.

6. REFERENCES

[1] *Application, Reference SANTE/E5: FORW. APPL. 1831-0084-2019

[2] *Annex I Submission number 1568060846597-2446

[3] *Technical dossier, Section II: 2.5 Conditions of use of the additive

[4] *Technical dossier, Section II: 2.2 Characterisation of the Active Substance

[5] *Technical dossier, Section II: Annex II.2.1.2.1

[6] *Technical dossier, Section II: 2.1.3 Qualitative and quantitative composition

[7] EURL Evaluation Reports:
https://ec.europa.eu/jrc/sites/jrcsh/files/finrep_fad-2019-0044_syncra.pdf
https://ec.europa.eu/jrc/sites/jrcsh/files/finrep-fad-2019-0009-galliprofit.pdf
https://ec.europa.eu/jrc/sites/jrcsh/files/finrep-fad-2017-0058-baci_subtilis.pdf

[8] *Technical dossier, Section II : Annex II 6.1.1 & Annex II 6.1.4

[9] *Technical dossier, Section II : Annex II 6.1.2 & Annex II 6.1.5

[10] Suplementary information EURL_ANOVA_FA-FS.pdf

[11] EN 15784:2009 - Animal feeding stuffs - Isolation and enumeration of presumptive Bacillus spp.

[12] EN ISO 7218:2007 - Microbiology of food and animal feeding stuffs – General requirements and guidance for microbiological examinations

[13] VDLUFA method –Enumeration of Bacillus licheniformis and Bacillus subtilis (VDLUFA Methodenbuch Bd.III, 28.2.2)

[14] European Community Project SMT4-CT98-2235."Methods for the Official Control of Probiotics Used as Feed Additives", Report 20873/1 EN (2002) ISBN 92-894-6250-7 (Vol. I) and Report 20873/3 EN (2002) ISBN 92-894-6252-3 (Vol. III)

*Refers to Dossier no: FAD-2019-0086

7. RAPPORTEUR LABORATORY & NATIONAL REFERENCE LABORATORIES

The Rapporteur Laboratory for this evaluation is the European Union Reference Laboratory for Feed Additives, JRC, Geel, Belgium. This report is in accordance with the opinion of the consortium of National Reference Laboratories as referred to in Article 6(2) of Commission Regulation (EC) No 378/2005, as last amended by Regulation (EU) 2015/1761.

8. ACKNOWLEDGEMENTS

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- Państwowy Instytut Weterynaryjny, Pulawy (PL)
- Instytut Zootechniki - Państwowy Instytut Badawczy, Krajowe Laboratorium Pasz, Lublin (PL)
- Centre wallon de Recherches agronomiques (CRA-W), Gembloux (BE)
- Österreichische Agentur für Gesundheit und Ernährungssicherheit (AGES), Wien (AT)
- Ústřední kontrolní a zkušební ústav zemědělský (ÚKZÚZ), Praha (CZ)
- Laboratoire de Rennes (SCL L35), Service Commun des Laboratoires DGCCRF et DGDDI, Rennes (FR)
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