

**Standard Method Performance Requirements (SMPRs®) for Fructans in Animal Food (Animal Feed, Pet Food, and Ingredients)**

Intended Use: Reference/Regulatory Method

**1 Purpose**

AOAC SMPRs describe the minimum recommended performance characteristics to be used during the evaluation of a method. The evaluation may be an on-site verification, a single-laboratory validation, or a multi-site collaborative study. SMPRs are written and adopted by AOAC stakeholder panels composed of representatives from the industry, regulatory organizations, contract laboratories, test kit manufacturers, and academic institutions. AOAC SMPRs are used by AOAC expert review panels in their evaluation of validation study data for methods being considered for *Performance Tested Methods*<sup>SM</sup> or *AOAC Official Methods of Analysis*<sup>SM</sup>, and can be used as acceptance criteria for verification at user laboratories.

**2 Applicability**

Measure total dietary fructan, such as inulin, levan, branched fructans, agavins (agave fructans), and fructooligosaccharides, in animal feed, pet food, and the corresponding ingredients. Method must be capable of distinguishing dietary fructans from interfering compounds such free glucose, fructose, sucrose, and other polysaccharides.

**3 Analytical Technique**

Any analytical technique(s) that measures the analyte(s) of interest and meets the following method performance requirements is/are acceptable.

**4 Definitions**

*Animal and pet foods.*—Material consumed or intended to be consumed by animals other than humans that contributes nutrition, taste, or aroma or has a technical effect on the consumed material. This includes raw materials, ingredients, and finished product. (AAFCO)

*Fructans.*—Any DP ≥ 3 carbohydrate with one or more fructosyl-fructose linear or branched linkages which constitute a majority of the linkages in which fructose is the major constituent and glucose content is 33% or less. Examples include inulin, levan, branched fructans (e.g., agave fructans), and fructooligosaccharides (FOS).

*Ingredients.*—The base materials used in the formulation of animal and pet foods.

*Limit of quantitation (LOQ).*—LOQ is the lowest level of analyte in a test sample that can be quantified at a specified level of precision.

*Recovery.*—The fraction or percentage of analyte that is measured when the test sample is analyzed using the entire method.

*Repeatability.*—Variation arising when all efforts are made to keep conditions constant by using the same instrument and operator (in the same laboratory) and repeating during a short time period. Expressed as the repeatability standard deviation (SD<sub>r</sub>); or % repeatability relative standard deviation (%RSD<sub>r</sub>).

*Reproducibility.*—Variation arising when identical test materials are analyzed in different laboratory by different operators on different instruments. The standard deviation or relative standard deviation calculated from among-laboratory data. Expressed as the reproducibility standard deviation (SD<sub>R</sub>); or % reproducibility relative standard deviation (%RSD<sub>R</sub>).

**5 Method Performance Requirements**

See Tables 1 and 2.

**6 System Suitability Tests and/or Analytical Quality Control**

Suitable methods will include blanks, and appropriate check standards.

**7 Reference Material(s)**

Refer to Annex F: *Development and Use of In-House Reference Materials* in Appendix F: *Guidelines for Standard Method Performance Requirements*, 20th Ed. of the *Official Methods of Analysis of AOAC INTERNATIONAL* (2016). Available at: [http://www.eoma.aoac.org/app\\_f.pdf](http://www.eoma.aoac.org/app_f.pdf)

**8 Validation Guidance**

Method data packages must include performance data covering the method claimed matrices. See Table 3 for suggested matrices. A useful tool can be found in the food pyramid concept described in Annex F of Appendix F the *Official Methods of Analysis of AOAC INTERNATIONAL*.

Method data packages must include relevant data regarding interferences, such as from sugars, sugar alcohols, and other carbohydrates. Method developers are responsible for assessing interferences with their method.

**9 Maximum Time-to-Results**

None.

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Operating range	0.2–100% (2 to 1000 g/kg) of dry matter
Limit of quantitation (LOQ) <sup>a</sup>	0.2% (2 g/kg) of dry matter
Linearity of standard curve	r ≥ 0.999, and 95% confidence limit of the y-intercept includes zero
<sup>a</sup> Methods that do not achieve the LOQ will still be considered.	

Range, %	0.2–1	>1–10	>10–100
Recovery, %	90–110	93–107	95–105
RSD <sub>r</sub> , %	≤7	≤5	≤3
RSD <sub>R</sub> , %	≤14	≤10	≤6

Wet and dry animal foods for a variety of species (swine, ruminants, poultry, fish, equine, dog, cat, etc.)
Pet treats
Forages, including cool-season grasses
Both linear (inulin and levan) and branched fructans
Feed ingredients, including fructan-containing vegetables