SLOVENSKI STANDARD
SIST EN ISO 6498:2012

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Krma - Smernice za pripravo vzorca (ISO 6498:2012)

Animal feeding stuffs - Guidelines for sample preparation (ISO 6498:2012)

Futtermittel - Leitfaden für die Probenvorbereitung (ISO 6498:2012)

Aliments des animaux - Lignes directrices pour la préparation d'échantillons (ISO 6498:2012)

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Foreword

This document (EN ISO 6498:2012) has been prepared by Technical Committee CEN/TC 327 “Animal feeding stuffs - Methods of sampling and analysis", the secretariat of which is held by NEN, in collaboration with Technical Committee ISO/TC 34 "Food products".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.

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Animal feeding stuffs — Guidelines for sample preparation

Aliments des animaux — Lignes directrices pour la préparation des échantillons

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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ISO 6498 was prepared by the European Committee for Standardization (CEN) Technical Committee TC 327, *Animal feeding stuffs — Methods of sampling and analysis*, in collaboration with ISO Technical Committee TC 34, *Food products*, Subcommittee SC 10, *Animal feeding stuffs*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 6498:1998), which has been technically revised.

This corrected version of ISO 6498:2012 incorporates the following correction: in 7.1, paragraph 4, the phrase “particle sizes below 4 mm ± 2 mm (4 mm to 6 mm) can be” has been substituted by “particle sizes of 4 mm to 6 mm can be”.

Animal feeding stuffs — Guidelines for sample preparation

1 Scope

This International Standard specifies guidelines for the preparation of test samples from laboratory samples of animal feeding stuffs, including pet foods.

NOTE 1 The guidelines mostly derive from those developed by AAFCO (see Reference [7]).

The guidelines are overruled by special instructions and regulations for sample preparation demanded by specific analysis methods.

NOTE 2 Such analysis methods are developed by ISO and CEN.

NOTE 3 This International Standard does not include special guidelines for sample preparation for microbiological analysis of microorganisms like yeasts, bacteria and moulds. Nonetheless, for microorganisms which are used as feed additives (probiotics), some important aspects of sample preparation are addressed.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 Definitions concerning "sample"

2.1.1
lot
quantity of material that is assumed to be of the same production process and represented by specified sampling rules

NOTE For the purposes of this International Standard, the rules are those of Commission Regulation (EC) No. 152/2009.[3]

2.1.2
laboratory sample
sample as prepared (from the lot) for sending to the laboratory and intended for inspection or testing

2.1.3
test sample
subsample or sample prepared from the laboratory sample and from which test portions will be taken

2.1.4
test portion
quantity of material drawn from the test sample (or from the laboratory sample if both are the same)

2.1.5
reserve sample
material left over from the laboratory sample when divided or subsampled test samples have been taken and on which no further particle size reduction is done

NOTE If, for example, mycotoxin or genetically modified organism analyses are done on the whole laboratory sample, then the reserve sample is also reduced to the corresponding particle sizes. The reserve sample should be stored under conditions maintaining integrity.

2.2 Definitions concerning “parameters”

2.2.1
parameter
analyte or constituent or microorganism for which the feeding stuff is to be analysed by microscopic, microbiological, biological or chemical procedures

2.2.1.1
stable parameter
analyte or constituent or microorganism which does not degrade during sample preparation on common handling or storage at room temperatures of 20 °C to 25 °C

2.2.1.2
unstable parameter
analyte or constituent or microorganism which degrades during sample preparation on common handling or storage at room temperatures of 20 °C to 25 °C because they are volatile, degradable, or sensitive to temperature, light, enzymatic degradation or chemical oxidation

NOTE Stability of parameters in this context refers only to the influence of sample preparation, such as intensive grinding, and not to a minimum shelf-life specified by producers or on the label, e.g. for a feed (additive).

Table 1 — Classification (in general) of stable or unstable parameters and reasons for degradation with a view to sample preparation

Origin	Stable parameters	Unstable parameters	Reason(s) for degradation/change
Nutrients	(Crude) protein, fat, ash, fibre	Moisture	Temperature (volatile)
	Starch, sugar, lactose	Ammonia	Temperature (volatile)
	Gas production and enzyme-soluble organic substance production in *in vitro* tests	Organic acids (e.g. lactic acid, acetic acid, butyric acid, fumaric acid, formic acid)	Temperature (volatile)
	Minerals (e.g. Ca, P, Mg, Na, K, Cl)	Unsaturated fatty acids	Air oxidation (can result in production of short-chain fatty acids)
Feed additives	Trace elements (e.g. Cu, Zn, Mn, Fe, Se, Co)	Vitamins (e.g. vitamin A, C, D, E)	Temperature, ultraviolet (UV) light, air oxidation (sensitive)
	Amino acids (e.g. lysine, methionine, tryptophan)	1,2-Propanediol, ethylene glycol	Temperature (volatile)
	Enzymes (e.g. phytases, non-starch polysaccharide enyzmes)	Microorganisms like probiotics (e.g. *Saccharomyces cerevisiae*, *Enterococcus faecium*)	Temperature (freezing), pressure (sensitive to grinding); moisture/dryness (influences growth of microorganisms)
Undesirable substances	Heavy metals (e.g. As, Pb, Cd, Hg)	Mycotoxins (e.g. aflatoxin B_1, deoxynivalenol, fumonisins, ochratoxin A, T-2 toxin, HT-2 toxin, zearalenone, ergot alkaloids)	Mould growth and change of mycotoxins possible at room temperature; UV light (sensitive – aflatoxin B_1)
	Dioxins and polychlorinated biphenyls (PCBs) with similar effects to dioxins	Drugs, antibiotics, pesticides	Temperature (sensitive)
		Hydrocyanic acid	Temperature (volatile)
Banned substances	Proteins of animal origin	Banned drugs, banned antibiotics	Temperature (sensitive)
(Other) Microorganisms		Yeasts, bacteria, moulds	Temperature (sensitive), dryness, influx of oxygen (anaerobiosis)

2.3 Examples of animal feeding stuffs characteristics

Some examples of animal feeding stuffs characteristics are given here to assist with the identification and grouping of a laboratory sample based on the terms and annexes used in these guidelines.

NOTE Definitions of animal feeding stuffs are given in legislation worldwide. Sample definitions from European directives and, for straight feeds, in an alphabetical list from a German committee are given in References [4][5][6][8].

2.3.1
birdseed
seeds that are intended to feed birds

EXAMPLES Grains and oilseeds.

2.3.2
whole cottonseed
unprocessed cottonseed product, including the hulls, lint, and meat

2.3.3
mineral mix
supplementary feed that mainly consists of mineral ingredients in either granular, bead or small pellet form and which is free flowing as an entire mix

NOTE Mineral pellets are an agglomerated mineral mix formed by a mechanical process (in general).

2.3.4
dry feeds
feed ingredient or complete animal feed which typically contains a moisture mass fraction of not more than 15 %

NOTE Dry feed pellets are an agglomerated dry feed produced by a mechanical process (in general).

2.3.5
green fodder
edible parts of plants, other than separated grain, that can provide feed for grazing animals or that can be harvested for feeding, including browse, herbage, and mast

NOTE Generally, the term refers to more digestible material in contrast to less-digestible plant material, known as roughage.

2.3.6
silage
forage preserved in a succulent condition by organic acids produced by anaerobic fermentation of sugars in the forage

2.3.7
roughage
fibrous, coarsely textured parts of plants

EXAMPLES Stovers, straws, hulls, cobs, and stalks.

2.3.8
hay
aerial portion of grass especially cut and dried for animal feeding

2.3.9
haylage
forage preserved in a succulent condition by organic acids produced by anaerobic fermentation of sugars in the forage with a moisture mass fraction of about 45 %

2.3.10
total mixed ration
TMR
single mixture of all feed ingredients (forages, grains, and supplements) that is supplied to an animal for a 24 h period

NOTE In practice, the 24 h allotment of the mixture may be offered in one or more feedings.

2.3.11
byproduct
product which remains after processes for the production of ingredients from plant material

EXAMPLE Dried distillers grains with solubles (DDGSs) from fermentation.

2.3.12
oilseed
any seed from which oil is extracted

EXAMPLE Sunflower seeds.

2.3.13
large block feed
molasses block feed
agglomerated feed compressed into a solid mass that is cohesive enough to hold its form

NOTE Large block feed weighs over 1 kg, generally about 20 kg. It may be marketed as a mineral block or a “caramelized” molasses drum, containing various minerals and nutrients. Samples may be received by the laboratory as large chunks, cores or “sticky clumps”.

2.3.14
liquid feed
feed product not solid and not aeriform

NOTE A liquid feed contains sufficient moisture to flow readily and may contain molasses.

2.3.15
canned pet food
feed product for pets which has been processed, packaged, sealed and sterilized for preservation in cans or similar containers

2.3.16
semi-moist feed
meat-based feed product for pets or aquatic animals that has been partially dried to prevent microbial decomposition

NOTE The moisture mass fraction may range from 15 % to 40 %. The product is generally in the form of strips or cubes and is designed to be stored at room temperature.

2.3.17
dog chew
rawhide bone
meat and skin or peel strip that has been nearly completely dried to a leather-like consistency

2.3.18
premixture
mixture of one or more micro-ingredients with diluent or carrier

NOTE Premixtures are used to facilitate uniform dispersion of the micro-ingredients (e.g. vitamins, probiotics, drugs or antibiotics) into a final feed.

2.3.19
range and alfalfa hay pellet
agglomerated feed formed by compacting and forcing the mix through, for example, square openings by a mechanical process

NOTE The pellets are mostly about 2 cm in diameter and 5 cm in length (volume about 16 cm^3) and may contain molasses; this definition also applies to alfalfa cubes (chopped alfalfa hay) of larger dimensions.

2.3.20
texturized feed
sticky feed
mix of assorted grains and commercial feed (generally pelleted), all of which has been treated with a coating of, for example, molasses

NOTE Some of the grains may have been steam heated or rolled prior to incorporation into the texturized feed.

2.3.21
aquatic feed
feed which is fed to aquatic animals and which has been mechanically processed into encapsulated pellets, flakes, crumble, and as packaged sealed powder

2.4 Definitions concerning “sample preparation procedure”

2.4.1
homogeneity
degree to which a property or a constituent is uniformly distributed throughout a quantity of material

NOTE Homogeneity may be considered to have been achieved in a practical sense when the sampling error of the processed portion is negligible compared to the total error of the measurement system. Since homogeneity depends on the size of the units under consideration, a mixture of two materials may be inhomogeneous at the molecular or atomic level, but sufficiently homogeneous at the particulate level. However, uniform visual appearance does not ensure compositional homogeneity.

2.4.2
partial drying
part of the sample preparation procedure for feedstuff samples with a high moisture content (dry mass fraction <85 %), in which the sample is carefully dried to allow subsequent sample preparation procedures to be applied, such as particle size reduction by grinding with a mill

NOTE 1 The partial drying procedure depends on the feeding stuff [e.g. at temperatures below 55 °C to 60 °C for silages], and on the heat stability of the parameters (e.g. 70 °C ± 10 °C for drugs and antibiotics).

NOTE 2 Samples for microbiological analysis should not be dried (at temperatures above 40 °C).

NOTE 3 Partial drying can also be achieved by a freeze-drying procedure, which is a careful drying process using a vacuum to allow moisture to evaporate.

2.4.3
coarse grinding
first grinding step of the whole sample when the laboratory sample contains large lumps or when its particle size is above about 6 mm before mass reduction

NOTE Coarse grinding is a special kind of particle size reduction that ensures homogeneity of the laboratory sample for subsampling purposes.

2.4.4
mass reduction
part of the sample preparation procedure to reduce the mass of a laboratory sample by dividing or subsampling it using (stationary or rotary) dividers or fractional (alternate) shovelling, without changing the consistency of the sample

NOTE After mass reduction, all subsamples should have the same properties as the original laboratory sample.