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# International Standard



# 5510

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## **Animal feeding stuffs — Determination of available lysine**

*Aliments des animaux — Dosage de la lysine disponible*

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## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5510 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

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# Animal feeding stuffs — Determination of available lysine

## 0 Introduction

Lysine in food products is generally considered to be assimilable when its terminal amino group (amino  $\epsilon$ ) is not combined. This fraction of lysine can be determined because these groups combine with 2,4-dinitrofluorobenzene.

## 1 Scope and field of application

This International Standard specifies a method for the determination of the available lysine in animal feeding stuffs containing animal or vegetable proteins.

Compared with biological determination, the method does, however, overestimate the amount of available lysine and care is necessary in interpreting the results.

## 2 References

ISO 5983, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content.*

ISO 6497, *Animal feeding stuffs — Sampling.*<sup>1)</sup>

ISO 6498, *Animal feeding stuffs — Preparation of test samples.*

## 3 Definition

**available lysine:** The quantity of lysine corresponding to the difference between the total lysine and the non-available lysine determined under the conditions specified in this International Standard.

It is expressed as a percentage by mass of the raw product.

## 4 Principle

Hydrolysis with hydrochloric acid of a ground test portion, followed by separation of the total lysine by column chromatography and determination by spectrometry at 570 nm.

Reaction of a second ground test portion with an ethanolic solution of 2,4-dinitrofluorobenzene in an alkaline medium,

purification, then hydrolysis with hydrochloric acid, separation of the non-available lysine by column chromatography, and determination by spectrometry at 570 nm.

## 5 Reagents

All the reagents shall be of recognized analytical grade. The water used shall be distilled water or water of at least equivalent purity.

**5.1 Diethyl ether**, free from peroxides.

**5.2 Sodium bicarbonate**, 80 g/l solution.

**5.3 2,4-Dinitrofluorobenzene (DNFB)**, ethanolic solution.

Dissolve 0,15 ml of DNFB in 12 ml of 95 % (V/V) ethanol.

Prepare this solution at the time of use.

**5.4 Hydrochloric acid**, approximately 6 mol/l.

Mix 1 volume of hydrochloric acid ( $\rho_{20} = 1,19$  g/ml) with 1 volume of water.

**5.5 Sodium citrate**, buffer solution, pH 2,2 approximately.

Successively dissolve in water

21 g of citric acid monohydrate;

8 g of sodium hydroxide;

16 ml of hydrochloric acid ( $\rho_{20} = 1,19$  g/ml);

0,1 ml of octanoic (caprylic) acid;

20 ml of thiodiglycol;

3 ml of a 30 % (V/V) aqueous solution of polyoxyethylene dodecyl ether with approximately 23 molecules of oxyethylene.<sup>2)</sup>

Dilute to 1 000 ml with water.

1) At present at the stage of draft.

2) A suitable commercially available product is BRIJ 35. This information is given for the convenience of the user of this International Standard and does not constitute an endorsement of this product by ISO.