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## Protein quality of *Lupinus angustifolius* – prediction of amino acids and crude protein with Near Infrared Spectroscopy

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**State of art and aim:** The quality evaluation of organic protein feedstuffs, especially the quick and easy determination of the protein quality including the amino acid (AA) pattern in locally grown legumes like lupins, is very important to fulfil the requirements regarding the protein and amino acid supply of organically fed animals, especially monogastrics. The analytical data of organically cultivated feeds, as compared with conventional table values, shows a clear deviation of protein and amino acids between conventional and organic feeds. The standard tabular values (DLG 2014) are not sufficient for the calculation of feed rations. Therefore the ability of NIRS to predict the chemical composition and the essential AA's of organically grown lupins was proofed.

**Results and discussion:** The statistical parameters of NIRS calibration (see table) showed that the predictions were successful for crude protein, lysine and cysteine. The prediction accuracy for the sulfur-containing AA's, methionine and cysteine and for threonine was satisfactory. The main reason that no more robust calibration equations were developed, was the fact, that especially the methionine contents were very low and the range was very small. Therefore lupin samples from future seasons should be used to improve the quality and to check the robustness of the developed calibrations. Nevertheless, NIRS can be used for the prediction of the protein quality in lupins as well as in other feed components (Aulrich & Böhm 2012) and for the direct, quick and easy calculation of feed rations directly after harvest.

**Table:** NIRS data and calibration statistics for prediction of crude protein and some amino acids in lupins

Ingredient (n)	Range (g/kg DM)	Mean (g/kg DM)	R <sub>K</sub>	SEP
Protein (525)	235 - 420	333.5	0.96	0.88
Lysine (196)	12.1 – 22.4	16.7	0.93	0.65
Methionine (204)	1.71 – 2.17	2.13	0.88	0.12
Cysteine (211)	3.39 – 7.55	4.54	0.91	0.31
Threonine (210)	8.84 – 14.8	11.61	0.85	0.65

R<sub>K</sub>: Regression coefficient of the calibration, SEP: Standard error of prediction

### References:

DLG (2014) DLG Futterwerttabellen-Schweine. DLG-Verlag, Frankfurt, Germany  
Aulrich & Böhm (2012) *Landbauforsch SH*, 362, 401

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**Tags:** *L. angustifolius*, protein quality, amino acids, NIRS.

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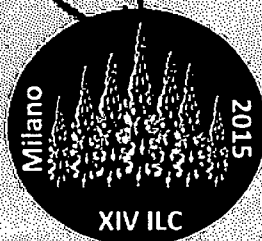
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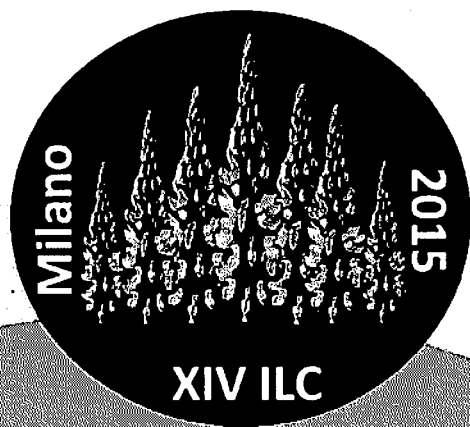
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