

# Buchi applications Feed & Forage



**Buchi offers a broad range of NIR applications dedicated to specific segments. The development of a calibration is a matter of experience that includes not only the spectroscopic model itself but the reference analytics in the laboratory. With more than 70 years of practical knowledge Buchi is a competent partner to support your daily business.**

## **NIR Measurements**

Measurements can be performed using the NIRFlex N-500 equipped with a Solids Measurement Cell or a Buchi NIRMasteR. Standard Petri Dishes are sufficient but a High Performance- or an Unbreakable- Sample Cup will be of advantage in several cases where a maximum of precision and accuracy is requested.

## **NIR Calibrations**

A reliable NIR calibration has to include all kind of variation that is necessarily incorporated into your samples. Our databases consist of thousands of spectra covering geographical and seasonal variation.

## **Reference Methods**

Buchi has many of the laboratory products necessary for an official and accredited analysis of the NIR reference parameters: e.g. heating oven for moisture determination in solids, Soxhlet and Extraction for fat and Kjeldahl for protein content.

## **Service and Support**

NIR spectroscopy is a lively and a living business. Calibration models have to be customized to give the best possible results. Our application specialists will give you the support that you request no matter if you want to use a "Plug and Play" solution with one of our Precalibrations or you want to develop your own chemometric models with our NIRCal software.

Product	Feed N555-503	Fish Meal N555-510	Soy Bean N555-513	Soy Bean Meal N555-514	Alfalfa	Rice Bran	Casava Meal
Property							
Moisture	5.2 - 14.6	2.3 – 10.4	5.8 - 15.8	8.1 – 13.9		7.2 – 12.01	8.2 – 11.8
Protein	6.5 - 57.4	30.0 – 71.9	29.6 - 38.5	33.1 – 50.9	11.6 – 17.5	10.1 – 15.1	0.9 – 3.7
Fat	1.3 - 15	5.2 – 11.8	13.1 - 21.5	0.5 – 6.5		7.9 – 20.1	0.2 – 1.5
Ash	1.8 - 32.7			5.1 – 7.8	8.0 – 13.1	5.7 – 11.6	1.5 – 8.6
Fibre	1.6 - 32.4			2.5 – 11.6	24.1 – 28.9	6.1 – 11.7	
Starch						14.0 – 38.0	
Tryps. Inh.				1.0 – 33.0			
Solub. Protein				66.0 – 81.0			
ADF *					22.2 - 50.0		
ADL *					4.4 – 12.9		
NDF *					29.2 – 58.3		
Dig. NDF *					24.4 – 58.2		
Dig. SS *					45.8 – 72.2		

Product	Barley	Starch	Sorghum	Different kind of fish powders
Property				
Moisture	11.5 – 18.8	2.3 – 7.9	10.9 – 15.5	
Protein	8.1 – 11.5	2.9 – 11.8	9.1 – 10.4	
Fat				15.7 – 59.3
Ash			1.0 – 1.5	

Parameters:

If not written differently all units are given as [%].

\* cell wall polysaccharide and lignin concentrations of alfalfa stem from detergent fiber analysis

**Color Codes:**

Blue: Buchi Precalibrations

Yellow: Applications in a growing state. Full access to all spectral data with the possibility for further development

## Compound Feed Applications

Product	Poultry	Ruminant	Swine	Equine	Aqua Feed
Moisture	6.3 – 16.7	3.8 – 16.8	2.7 – 16.2	3.8 – 16.8	0.8 – 13.3
Protein	11.0 – 46.0	8.5 – 46.6	7.7 – 46.4	7.5 – 46.6	23 – 63.3
Fat	0.85 – 14.4	1.1 – 11.0	0.5 – 19.8	1.1- 15.9	3.8- 33.7
Fibre	0.6 – 17.5	1.4 – 18.9	0.6 – 13.4	1.4 – 24.8	0.1 – 1.7
Ash	1.0 – 33.9	1.6 – 16.6	1.6 – 21.1	1.5 – 16.6	6.9 – 16.8
Starch		0.6 – 58.7	2.0 – 45.3	1.4 – 63.7	1.9 – 63.7
Total Sugar				0.5 – 29.7	
NDF				2.4 – 69.1	2.4 - 69.1
FAH	2.3 – 13.0				

Parameters:

If not written differently all units are given as [%].

## Feed Ingredients Applications

Product	High protein low oil	High protein high oil	Low protein low oil	Low protein high oil	Cereals	Legumes	Milk-powder	Animal proteins
Moisture	3.2 – 17.6	2.8 – 20.11	2.5 – 17.2	1.4 – 13.7	9.5 – 20.6	6.7 – 17.9	0.7 – 13.8	0.9 – 20.7
Protein	17.7 – 69.5	7.6 – 47.7	1.5 – 34.1	4.8 – 23.8	5.0 – 20.6	8.1 – 37.3	3.9 – 39.4	22.8 – 99.0
Fat	0.03 – 24.1	0.8 – 58.8	0.04 – 24.1	0.8 – 24.1	0.6 – 24.1	0.4 – 24.1	0.1 – 26.5	0.4 – 36.2
Fibre	0.08 – 34.4	0.9 – 36.4	0.5 – 34.1	0.06 – 18.6	0.1 – 13.3	2.7 – 27.6		0.1 – 17.6
Ash	0.4 – 31.9	0.9 – 19.4	0.3 – 13.5	0.3 – 16.2	0.3 – 4.5	1.1 – 12.2	2.9 – 25.9	1.1 – 55.1
Starch	0.9 – 34.4	0.55 – 28.0	0.1 – 67.9	0.3 – 54.8	30.6 – 69.5	0.5 – 57.9	30.6 – 69.5	
Total Sugar	0.5 – 29.7	0.5 – 29.7	0.5 – 29.7	0.5 – 29.7	0.5 – 29.7	0.5 – 29.7	32.4–81.8*	
NDF	2.4 – 69.1	2.4 – 69.1	2.4 – 69.1	2.4 – 69.1	2.4 – 69.1	2.4 – 69.1		
NCGD	45.7 – 97.5	45.7 – 97.5	45.7 – 97.5	45.7 – 97.5	45.7 – 97.5	2.4 – 69.1		

\*: Lactose

### Sample Preparation

Mostly no preparation is necessary as the samples are powders and fine materials. In case of inhomogeneities a blender for further grinding might be useful to give better results.

Among others, the ingredients cover:

Line-, Rape-, Soy-, Rape-, Sunflowerseeds, Rye, Sorghum, Wheat, Maize, Barley and Beans

A further specialization and calibration adaptations to these product types are possible.

Parameters:

If not written differently all units are given as [%].

### Color Codes:

Magenta: Applications are composed of a solid base of several hundred or thousands of spectra.

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