Application Note EDXRF1425

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EDXRF1425 - Analysis of Iron in Straw

Scope

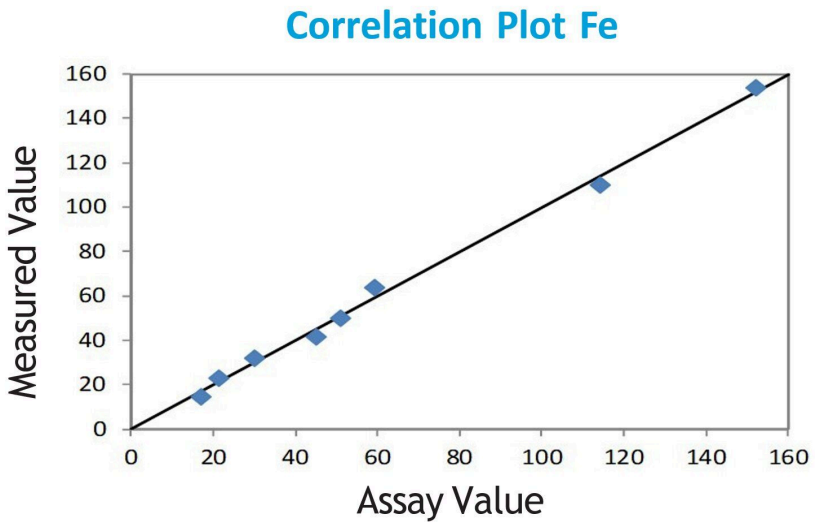
The measurement of iron in straw as a raw material for veal and cattle feed is demonstrated.

Background

The production and use of animal feeds is an important global industry estimated in the hundreds of billions of dollars. Monitoring feeds and premixes is critical to ensure proper nutrient balance for the animal lifecycle, as well as to ensure no unwanted elements are present. Particular feeds are formulated for specific needs. In the case of the straw and hay, a low iron content is desirable. For example, feed for veal calves is intentionally kept low in iron content. In the milling of straw, hay, and other fodder, excessive iron may accumulate as contamination from the milling and grinding process itself, so the iron content in fodder is monitored to ensure excessive Fe contamination is not present. EDXRF (energy-dispersive X-ray fluorescence) is a simple, non-contact, non-destructive analysis technique that
is ideal for use in the measurement of elemental concentration. The Rigaku NEX QC analyzer meets this industry need with a small, self-contained analyzer that is simple to use, giving quality technicians fast analysis times during the processing and use of raw materials and animal feeds.

Calibration

Empirical calibration was built using 8 samples assayed for Fe. Calibration accuracy depends mainly on sample homogeneity, the homogeneity of the master sample from which splits are taken for assaying, and consistent sample preparation.



Element: Fe Units: ppm		
Sample I.D.	**Assay value**	**Measured value**
1	17	15
2	21	23
3	30	32
4	45	42
5	51	50
6	59	64
7	114	110
8	152	154

Precision

Instrument repeatability (precision) is determined by ten repeat analyses of each sample in static position. Representative samples are shown here.

Element: Fe Units: ppm				
Sample	**Assay Value**	**Average Value**	**Std. Dev**	**% Relative**
1	17	19	2.4	14%

4	51	50	2.7	5.3%
7	114	116	3	2.6%
8	152	155	4	2.6%

Conclusion

The results shown here indicate the Rigaku NEX QC analyzer is an excellent tool for quality technicians in the production and use of straw, hay and other fodder, and other similar animal feeds.

Related products

NEX QC II Series

Compact, intuitive benchtop EDXRF for everyday elemental testing