

Crude and total fat determination in feed samples by Hot Extraction

HydroEx H-506, FatExtractor E-500 HE

1. Introduction

Simple and reliable procedures for the crude and total fat determinations in feed products are introduced. This Application Note follows the official method ISO 11085:2015, AOAC 920.39 and AOAC 2003.05. The directive includes both direct extraction (crude fat) and extraction after acid hydrolysis (total fat).

2. Experimental

Equipment: HydroEx H-506, FatExtractor E-500 HE

Samples:

- Green meal pellets (certified dry matter crude and total fat content: 2.24 % ± 0.228 and 2.89 % ± 0.333)
- Complete feed for turkeys (certified dry matter total fat content of 5.11 % ± 0.447)

Procedure: For total fat determination, a hydrolysis using 4 M HCl was performed prior to extraction. For crude fat determination, the sample was mixed with sodium sulfate and dried in a drying oven. The prepared samples were extracted using hot extraction according to the parameters listed in Table 1.

Table 1: Parameters for crude and total fat extraction with the FatExtractor E-500 HE.

Parameter	Value: 50 mL	Value: 100 mL	Heating level
Solvent	Petroleum ether	Petroleum ether	
Extraction	5 min	5 min	5
Rinse	30 min	33 min ¹	5
Number of Drains	3	13	
Drying	3 min	3 min	3
Solvent volume [mL]	50	100	
Short Drain Interval	Off	On	

Short Drain Interval is a new feature for the FatExtractor E-500, introduced with the version 1.08. Activated Short Drain Interval reduces the

time between the drains, enabling the use of large solvent volumes with little to no increase of extraction time, to fully immerse samples in solvent.

3. Results and discussion

The results of the crude and total fat determination in animal feed products are presented in Table 2.

Table 2: Results for the determination of crude and total fat content in feed samples, using FatExtractor E-500 HE

Sample	Solvent [mL]	Mean value	Limit of tolerance
Crude fat			
Green meal pellets	50	2.06% (rsd : 0.47%)	2.012% - 2.468%
Green meal pellets	100	2.10% (rsd : 1.11%)	2.012% - 2.468%
Total fat			
Green meal pellets	50	2.83% (rsd : 6.64%)	2.557% - 3.223%
Green meal pellets	100	2.61% (rsd : 9.69%)	2.557% - 3.223%
Complete feed for turkeys	50	5.35% (rsd : 4.63%)	4.663% - 5.557%
Complete feed for turkeys	100	5.33% (rsd : 0.89%)	4.663% - 5.557%

4. Conclusion

The determination of the crude and total fat content in feed samples using the HydroEx H-506 and the FatExtractor E-500 HE provides reliable and reproducible results. The determined fat contents correspond well to the referenced values.



¹ Rinse time proposed by the FatExtractor E-500 depending on the selected amount of drains