SCF 505 Extraction of Fat from Animal Feed using Supercritical Fluid

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Introduction

The traditional method for the determination of raw fat in animal feed typically employs extraction by petroleum ether usually following an acid hydrolysis. This method is rather slow, and requires the use of organic solvents with the subsequent production of waste solvents.

In recent years, alternative techniques for fat determination have been introduced. One of these methods is the extraction of CO_2 under supercritical conditions (SFE).

Fat extractions by SFE were conducted on different feedstuffs, including feed mixture for cattle, pigs, poultry, and fish, as well as various raw materials, and were statistically compared to the standard petroleum ether extraction technique

Equipment

- ✓ Applied Separations' *Spe-ed*™SFE Supercritical Extraction System

Materials

- ✓ *Spe-ed* Matrix (Cat. #7950)
- ✓ *Spe-ed* Wool (Cat. #7953)
- ✓ Carbon dioxide – Zero grade

Method

Weigh 5g of ground sample into 7g of Spe-ed Matrix. Pour sample into extraction vessel and install into SFE oven. Extract sample as per extraction conditions. Collect fat in tared collection vial.

Extraction Conditions

Extraction vessel:	24mL
Sample:	5g Animal Feed
Pressure:	9000 psi
Temperature:	100ºC
Valve temperature:	110ºC
CO_2 Flow Rate:	3L/min
Collection:	60mL tared vial

Results

	Pig Feed	Cattle Feed	Poultry Feed
% Fat	4.73	7.17	4.19
S_r *	0.20	0.22	0.20
N	5	4	4

*Standard deviation of reproducibility

Conclusion

The accuracy and precision of the supercritical CO_2 fat extraction compared closely to the traditional petroleum ether extraction technique. In addition, there was no acid hydrolysis step, process time was reduced, and hazardous solvents were eliminated.