

Supercritical Fluid Application Notes

**SCF
515**

Fat Extraction Fat from Cattle Feed Using Supercritical Fluids

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Introduction

The traditional method for the determination of raw fat in cattle 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 CO₂ under supercritical conditions (SFE).

Fat extractions by SFE were conducted on different feedstuffs, including feed mixture for cattle, 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 Cattle Feed
Pressure:	9000 psi
Temperature:	100°C
Valve temperature:	110°C
CO ₂ Flow Rate:	3L/min
Collection:	60mL tared vial

Results

Cattle Feed	
% Fat	7.17
S _r *	0.22
N	4

*Standard deviation of reproducibility

Conclusion

The accuracy and precision of the supercritical CO₂ 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.

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