

**SCF 505** Extraction of Fat from Animal Feed using Supercritical Fluid

**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<sub>2</sub> 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*<sup>TM</sup> 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: 100°C  
 Valve temperature: 110°C  
 CO<sub>2</sub> Flow Rate: 3L/min  
 Collection: 60mL tared vial

**Results**

	Pig Feed	Cattle Feed	Poultry Feed
% Fat	4.73	7.17	4.19
S <sub>r</sub> *	0.20	0.22	0.20
N	5	4	4

\*Standard deviation of reproducibility

**Conclusion**

The accuracy and precision of the supercritical CO<sub>2</sub> 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.