SCF 507 Extraction of Fat from Meat Using Supercritical Fluids

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Introduction

The extraction of fat in meat is traditionally conducted in the quality control laboratory by the soxhlet extraction technique. If food samples contain lipids bound to membranes, the lipids must first be released from the sample by an acid hydrolysis procedure. These procedures are labor intensive, difficult to automate, and require the use of toxic solvents.

Supercritical carbon dioxide can be used as an alternative solvent to rapidly extract the fat from meat, eliminating the need for hazardous solvents.

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 2g of ground meat sample to an accuracy of ± 0.1mg into a beaker containing 4g of *Spe-ed* Matrix. Mix the sample until the meat is dispersed and transfer the mixed sample to a mortar and disperse meat with a pestle.

Place a wad of *Spe-ed* Wool into an extraction vessel and pour the prepared sample into the vessel using a funnel, then place a wad of *Spe-ed* Wool on top. Compress the sample with a tamping rod, fill the void volume with *Spe-ed* Matrix and seal the vessel. Install the extraction vessel into the *Spe-ed* SFE with the sample bed toward the outlet. Place a pre-dried and pre-weighed collection vial containing a wad of *Spe-ed* Wool on the discharge tube. Extract samples according to the extraction conditions.

Extraction Conditions

Extraction vessel:	24mL
Sample:	2g
Pressure:	9000 psi
Temperature:	80ºC
CO2 Flow Rate:	3L/min.
Collection:	Pre-Weighed Collection vial
Static:	5 minutes
Dynamic:	25 minutes

Results

	% Fat		%Fat	
	SFE	SD	Soxhlet	SD
Standard Fresh Pork	18.10	0.15	18.0	0.41

N=6

Conclusion

Supercritical carbon dioxide extraction of fat from fresh pork was accurate and precise when compared to the standard soxhlet method. In addition, sample processing time was reduced and hazardous solvents were eliminated.

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