

# *Animal Metabolism-Agricultural Chemicals Research*



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# Mission

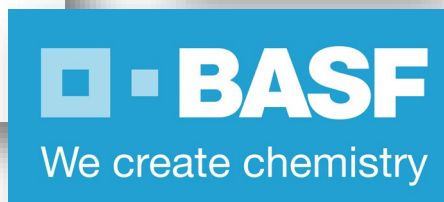
Investigate the fate of chemicals in food animals and food animal systems



[www.ars.usda.gov/oc/images/photos/](http://www.ars.usda.gov/oc/images/photos/)

# Chemistries

- Polychlorinated Dioxins/Furans
- Microplastics
- Chloroxyanions/Chlorine dioxide
- Glycerol ester feed additives
- Hemp Cannabinoids
- Perfluoroalkyl substances (PFAS)



**U.S. FOOD & DRUG**  
ADMINISTRATION



United States Department of Agriculture  
Natural Resources Conservation Service



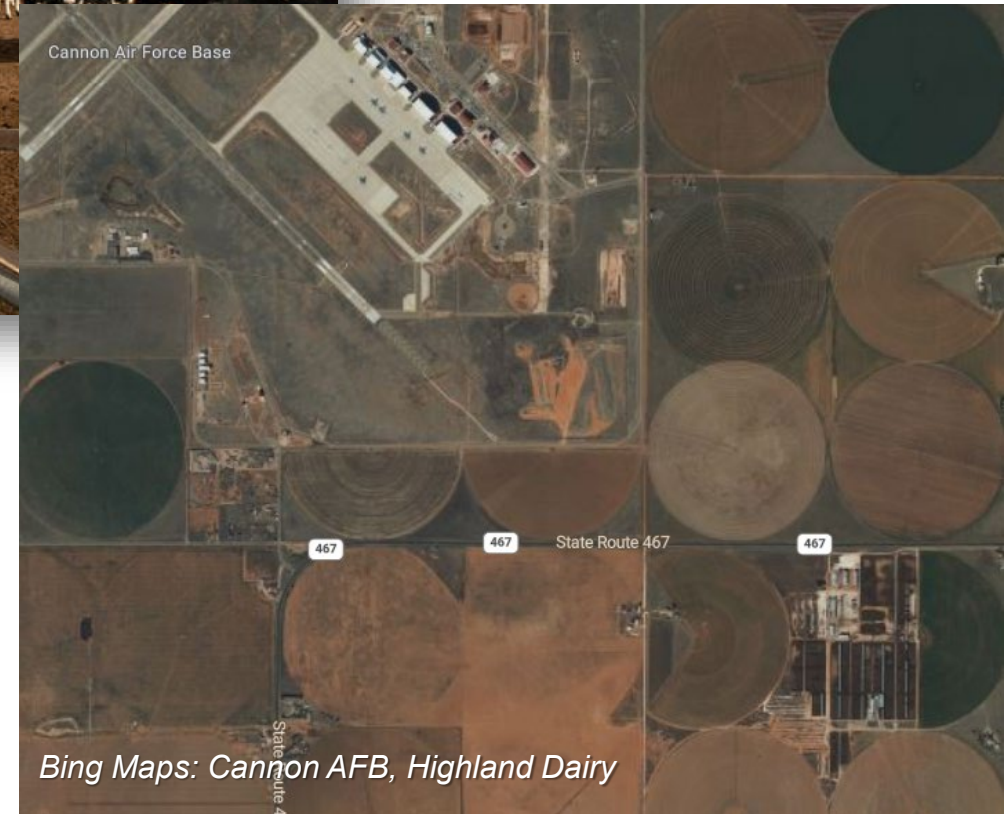
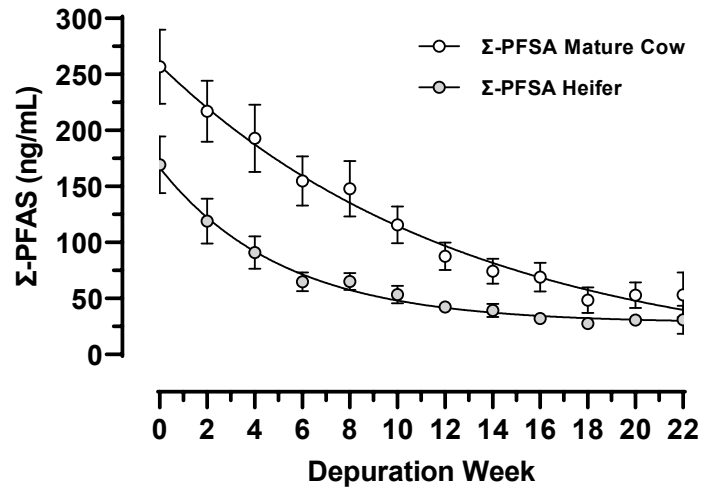
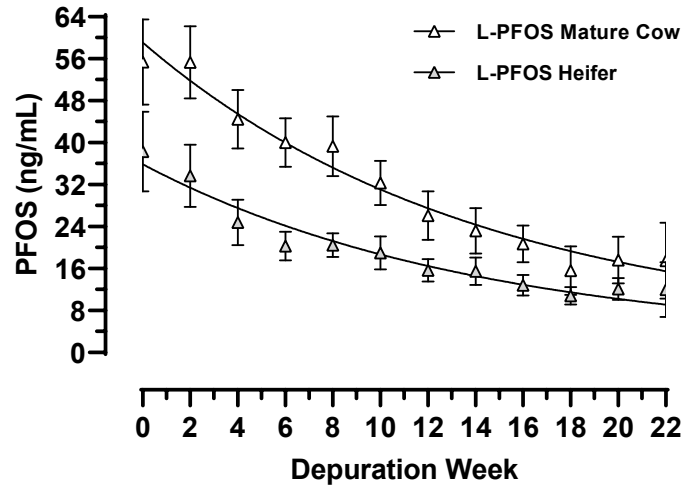
# State-of-the-Art PFAS Remediation in Livestock

## ***Provide clean feed and water!***

- PFAS elimination half-lives exceed production cycles of most livestock species
- Not useful for real-world contamination events involving market animals



# Unassisted Depuration



# Is PFAS Remediation Possible?



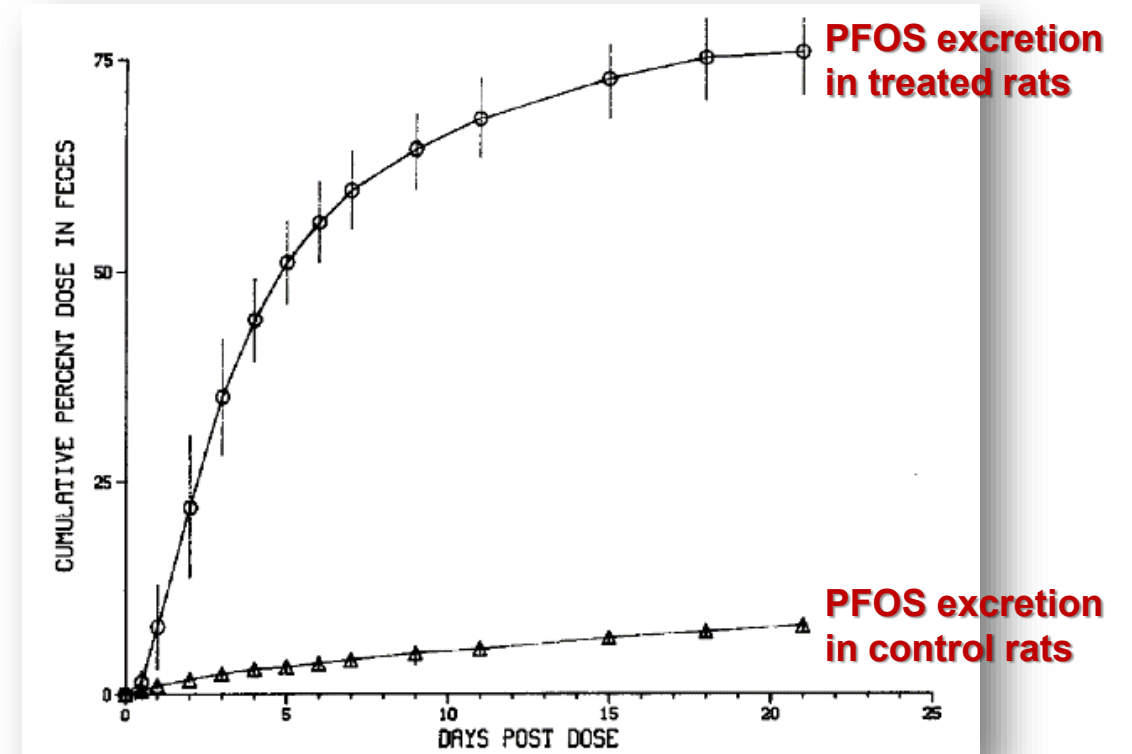
FUNDAMENTAL AND APPLIED TOXICOLOGY 4, 972-976 (1984)

Cholestyramine-Enhanced Fecal Elimination of Carbon-14 in Rats after Administration of Ammonium [ $^{14}\text{C}$ ]Perfluorooctanoate or Potassium [ $^{14}\text{C}$ ]Perfluorooctanesulfonate

JAMES D. JOHNSON,<sup>1</sup> SHEILA J. GIBSON, AND ROBERT E. OBER

*Riker Laboratories, Inc., 3M Center, Building 270-3S-05, St. Paul, Minnesota 55144*

Johnson et al., 1984



PFOS excretion in rats

# Perfluoroalkyl Remediation Studies

## Remediation Studies

- ✓ Determine the usefulness of proprietary sorbents at **preventing** the accumulation of PFAS residues in broiler model
- Determine the usefulness of dietary sorbents at **remediating** PFAS residues in animals already contaminated with PFAS
- ✓ Bioavailability of PFAS on PFAS-saturated sorbents fed to uncontaminated animals
- Determine usefulness of natural, semi-synthetic, and synthetic sorbents for PFAS mitigation
  - Water
  - Livestock



Weaver Labs  
Stillwater, OK



# *Singh Laboratory*

Design of unique dual characteristic materials:

- Adsorbents
- Catalytic Degradation
  - completely destruct PFAS
  - convert to valuable organofluorine precursors

Rapid analysis of PFAS

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# *Shelver Laboratory*

- Utilize microbes:
  - to sorb PFAS and/or
  - biotransform PFAS





# *Lupton Laboratory*

- Beef cattle exposure depuration in contaminated system
  - University of Pennsylvania
- Absorption, distribution, excretion studies hogs, sheep
  - University of Maine
  - Proprietary feed additives on depuration
- Analytical method development
  - USDA FSIS and US FDA
  - Rapid screening methods (~ 1 min/sample)

# *The Door is Always Open*



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