

Alfred Aleguas, PharmD¹, Julia Pearson, PhD², Tamas Peredy, MD¹

¹ Florida Poison Information Center-Tampa, Tampa General Hospital, Tampa, FL

²Medical Examiner Dept., Hillsborough County Dept. of Health, Tampa, FL

Objective We report the adulteration of beef with Lysergic acid diethylamide and the subsequent poisoning of a family of four.

Case Report The regional poison center was contacted by a hospital to report possible food poisoning of a family that became ill within an hour after eating a meal. The family had moved into their house the previous weekend. The adult male had prepared a meal with 'bottom round' cut beef, vegetables and cheese, wrapped in a wheat flatbread. The ingredients had been purchased immediately prior to preparation. The father noted a strange odor when the oven was turned on for the first time. Four members of the family consumed the fajitas although one child ate beef only without vegetables. The adult male ate prior to the others and complained of dizziness, feet numbness, abdominal pain, and noted dilated pupils. The adult female drove them all to the Emergency Department. While in ED, the wife and the children ages five and seven became symptomatic. All had similar complaints of dizziness, hallucinations, and tingling extremities.

On admission to the ICU the adult male was agitated, disoriented, tachycardic (125 beats per minute), and hypertensive (170/89 mm Hg). The adult female was pregnant near full term. Decreased fetal heart rates were detected. She was taken to the operating room for an emergent cesarean section. Both children were electively intubated and admitted to the Pediatric ICU. The adult male was amnesic to recent events upon waking up in the ICU. Eight hours post-ingestion, the adult female appeared more lucid but continued to "lose focus and had to be redirected." She corroborated the adult male's account. Both children did well in the PICU, and were weaned off sedation and extubated within 18 hours of presentation. All patients experienced resolution of their symptoms and were ultimately discharged from the hospital within two days.

The police were dispatched to the scene. They noted a strong odor of old cooking grease in the house. Scraps of meat and packaging were collected for evidence and forwarded to the County Forensic Toxicology Laboratory for analysis. No illicit drugs or chemicals were found.

Method: The victims' hospital admission blood and urine specimens were screened using a routine liquid/liquid alkaline drug screen by Gas Chromatography and Mass Spectrometry (GCMS). Other than caffeine, no drugs were detected in the blood and urine specimens. Based on case history, several pieces of the steak fajita meat were homogenized in water and extracted using a routine liquid/liquid alkaline procedure followed by analysis by GCMS. A compound that eluted approximately one minute after cholesterol indicated a potential library match to Lysergic Acid Diethylamide (LSD). Subsequently, a standard of LSD and Lysergic Acid Methylpropylamide (LAMP) were purchased for a definitive GCMS identification and confirmation. In addition, the victims' urine specimens were sent to an outside reference laboratory for a targeted analysis of LSD by Immunoassay and confirmation by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Results: LSD was identified on the steak fajita meat by GCMS comparison to an underivatized standard of LSD as well as a GCMS comparison to the BSTFA derivatized standard of LSD. Targeted analysis of LSD by LC-MS/MS confirmed the presence of LSD in three of the victims' urine samples (the fourth victim's urine specimen had insufficient volume for LSD analysis).

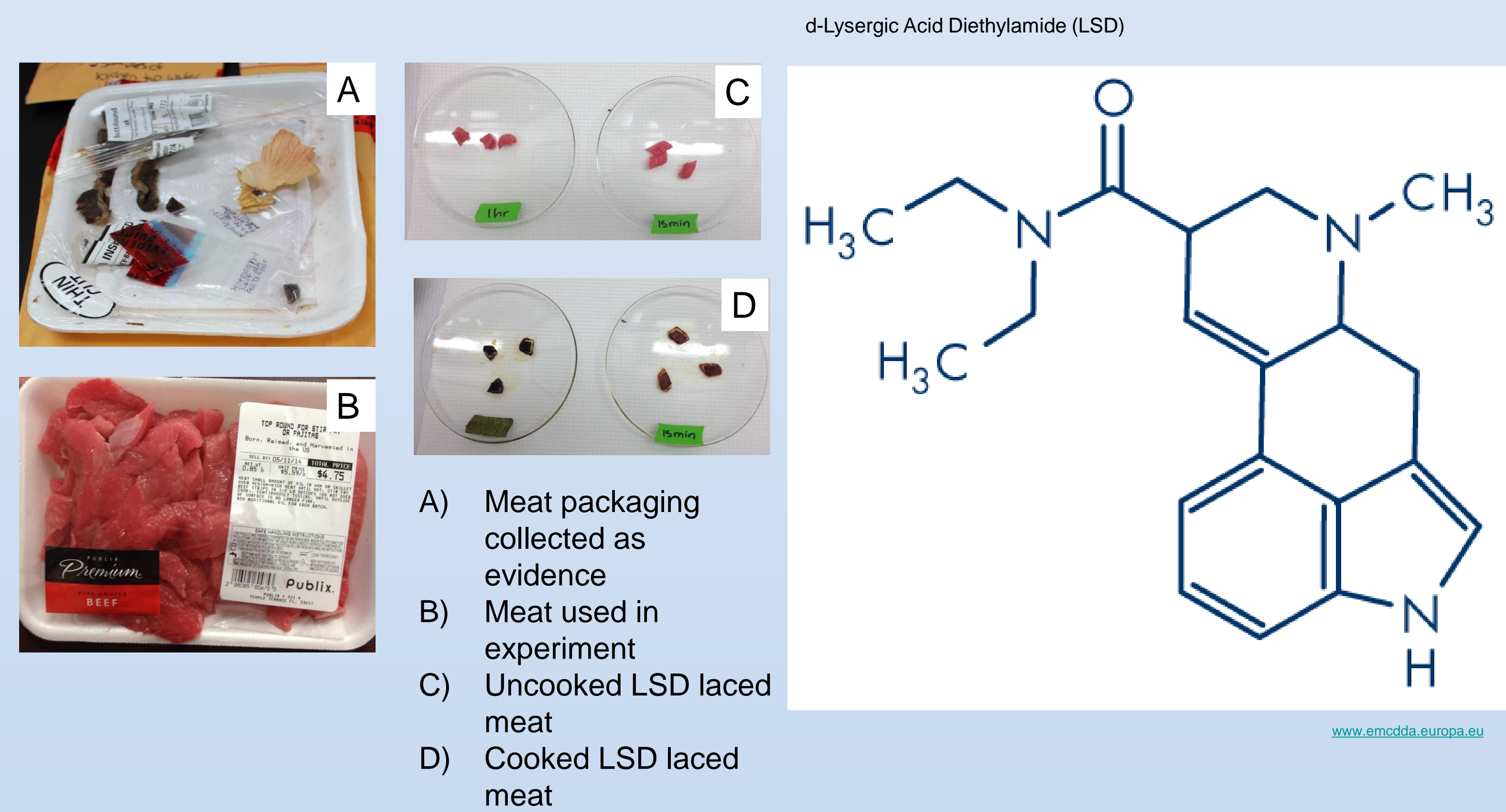
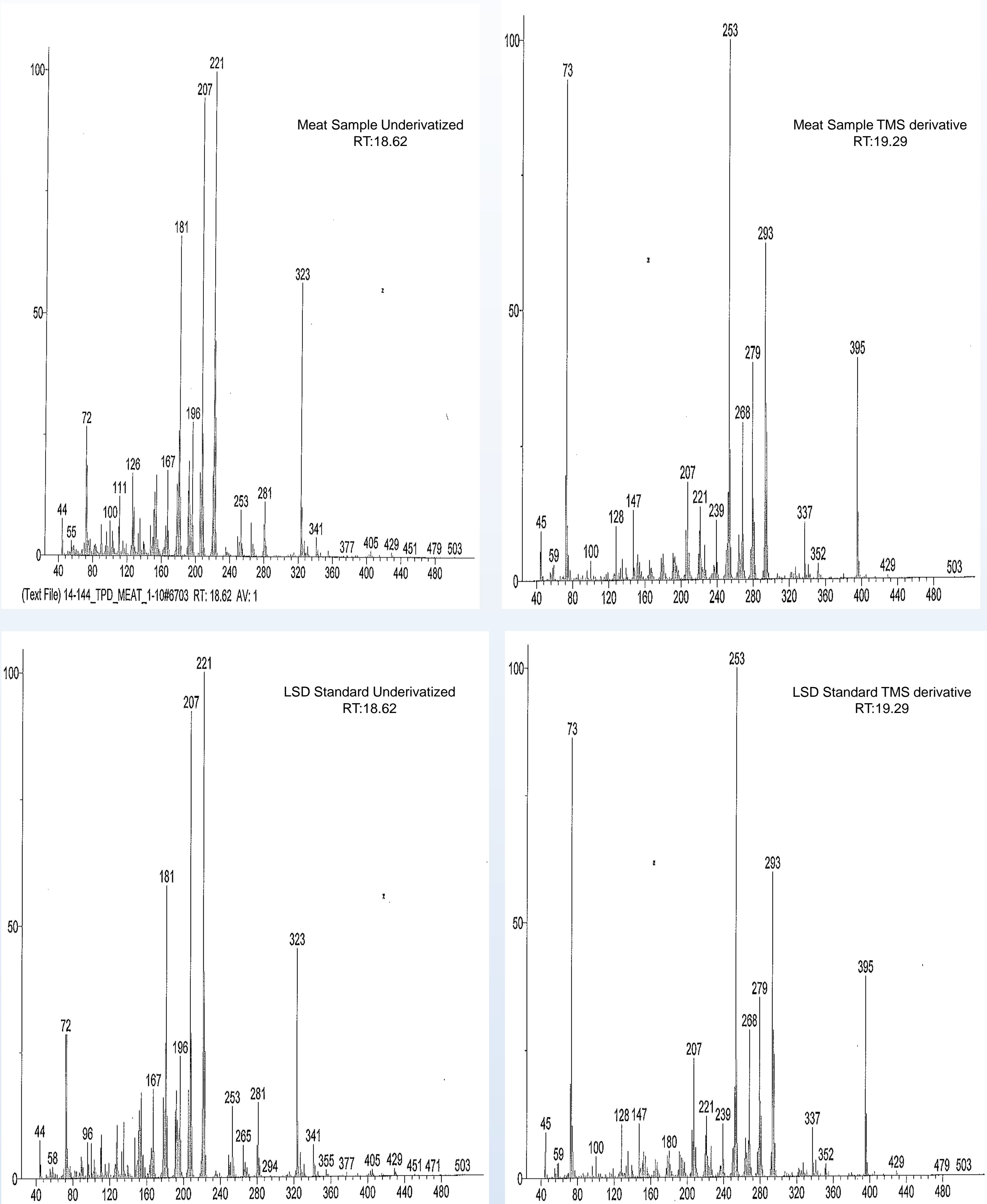
Discussion: The Toxicologist on-call at the PC was consulted. Despite a negative standard urine drug screen for drugs of abuse it was suggested that the case series was consistent with a hallucinogen.

An investigation into the sourcing and exposure pathway commenced. Perceiving a possible public health threat, local police were dispatched to the store where all similar meat sales were discontinued. The medical examiner's office was contacted to assist in the analyses of meat samples. GCMS identified the presence of LSD. Inspectors from the US Department of Agriculture (USDA) traced the beef back to the particular slaughterhouse. No anomalies or other reported cases were uncovered along the routes of distribution.

Local police, USDA, and FDA agents interviewed the family and found no evidence that the parents had drugged the meat themselves. Both parents agreed to polygraph testing and passed. There was no LSD residue in the oven.

Due to the known instability of LSD to heat and light, the forensic testing laboratory performed an experiment grouping samples into three arms to determine whether the drug would still be present if cooked in meat as the adult male had asserted. Three pieces of meat the same size as recovered in the residence were spiked with 100 ng/mL of LSD. One group was the control; one group was baked for 15 minutes at 150°C (duplicating the family's cooking temperature), and another was baked for 60 minutes at 150°C. GC/MS detected 85% of the control amount after baking for 15 minutes, and 0% was detected after baking for 1 hour. The same methods and results were confirmed by the toxicology laboratory at the Food and Drug Administration (FDA).

The investigation was ultimately closed without resolution eight months later.



Conclusions: Contamination of food with hallucinogens is an extremely rare event. Forensic analysis of the suspected source identified LSD. Despite a law enforcement investigation, the origin of the spiked hallucinogen could not be identified.

References:

- Baselt RC. Lysergic Acid Diethylamide. In: Baselt RC ed. Disposition of Toxic Drugs and Chemicals in Man. 5th ed. Foster City, United States: Chemical Toxicology Institute, 2000:486-489.
- Passie T, Halpern L, Stichtenoth D, et al. The Pharmacology of Lysergic Acid Diethylamide: A Review. CNS Neurosci Ther 2008;14(4):295-314.
- Eveloff H. The LSD Syndrome. Calif Med 1968;109(5):368-373
- Leister M. A review of lysergic acid diethylamide (LSD) in the treatment of addictions: historical perspectives and future prospects. Curr Drug Abuse Rev 2014;7(3):146-156.
- Francom P, Andrenyak D, Lim HK, et al. Determination of LSD in urine by capillary column gas chromatography and electron impact mass spectrometry. J Anal Tox 1988;12:1-8.
- Hardman JG, Limbird LE, eds. Goodman & Gilman's the pharmacological basis of therapeutics. New York, NY: McGraw-Hill Co., 1996.