Benha University
Faculty of Veterinary Medicine
Department of Food Hygiene and Control

Chemical residues in meat Products

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Presented by

Ellia Youssef Mehawed Abd El-Shahid
B.V.Sc., Assiut University, (1992)
M.V. Sc. (Meat Hygiene), Cairo University, (2015)

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Under the supervision of

Prof. Dr. Hemmat Moustafa Ibrahim
Professor of Meat Hygiene and Course Coordinator of Food Quality and Control Programme (FQCP)
Faculty of Veterinary Medicine
Benha University

Prof. Dr. Mohamed Ahmed Hassan
Professor and Head of Food hygiene and Control department
Faculty of Veterinary Medicine
Benha University

Prof.Dr. Mohamed Ahmed El. Shater
Chief Researcher
Department of Food Hygiene and Control
Animal Health Research Institute, Dokki, Giza

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Name	: Ellia Youssef Mehawed Abd El-Shahid
Date of Birth	: 17/9/1969
Nationality	: Egyptian
Degree	: Ph.D.V.Sc.
Specialization	: Hygiene and Control of Meat and Its Products
Title of thesis	: Chemical residues in meat products

Supervisors:

1. **Prof. Dr. Hemmat Moustafa Ibrahim**
   Professor of Meat Hygiene and Course Coordinator of Food Quality and Control Programme (FQCP), Faculty of Veterinary Medicine, Benha University.
2. **Prof. Dr. Mohamed Ahmed Hassan**
   Professor and Head of Food Hygiene and Control department, Faculty of Veterinary Medicine, Benha University.
3. **Prof. Dr. Mohamed Ahmed El. Shater**
   Chief Researcher, Department of Food Hygiene and Control, Animal Health Research Institute, Dokki, Giza

Abstract

Antibiotics, zeranol hormone, trenbolone hormone, heavy metals (Cadmium Cd, Lead pb, Zinc Zn and Arsenic As) and pesticides (Organophosphates and Organochlorine) residual levels were assessed in some meat products (Burger, Luncheon, Frankfurter and Sausage) sold in Giza Governorate, Egypt. A total of three hundred samples from four meat products (Burger, Luncheon, Frankfurter and Sausage) (75 for each) were collected from different local markets, and supermarkets in Giza Governorate, Egypt. Antibiotic residues were determined with 4 plates test, Zeranol, trenbolone hormones were determined with Rida screen ELISA kit for tissue. The examined samples were also analyzed for Cadmium (Cd), Lead (Pb), Zinc (Zn) and Arsenic (As) by atomic absorption spectrophotometer. The organophosphate pesticides were detected using Agilent Gas Chromatography GC. The organochlorine pesticides were detected using Gas Chromatography with Flame Photometric Detector (GC-FPD). The incidence percent of antibiotics, organophosphate pesticides (OPPs) and arsenic (As) residues were were not detected in all examined samples of meat products, as well as zeranol residues in burger and frankfurter were not detected. The zeranol residues was recorded in all examined sausage samples (No: 75) (100%) with mean value of 0.3721 ppb while relatively lower samples of luncheon (25) samples with a percentage of (33%) with mean value of 0.0732 ppb. The trenbolone residues were recorded in 75 (100%) of examined samples of both burger and sausage with mean value of 0.1368 ppb for burger and mean value of 0.1437 ppb for sausage. Concerning trenbolone residues in Luncheon and Frankfurter with the same number of positive samples for trenbolone residues, 50 sample (67%) for each of them with mean value of 0.2213ppb in Luncheon and with mean value of 0.1776 ppb in Frankfurter; Lead was present in all examined samples of burger (75) sample (100%) with mean value of 0.04844ppm. On the other hand, lead was present in 50samples (67%) of each Luncheon, Frankfurter and Sausage with mean value of 0.0504 ppm, of 0.0165ppm and 0.2575 ppm. The highest incidence of cadmium was recorded in 50 samples (67%) in each of burger with mean value of 0.00298 ppm and frankfurter with mean value of 0.0044 ppm, while relatively lower incidence of cadmium was reported in Luncheon samples with mean value of 0.0019 ppm. The cadmium residues were not recorded in any of sausage

samples. The zinc residues were present in all examined samples 75 (100%), of burger, sausage and frankfurter with mean value of 0.44784 ppm, 0.6132 ppm and 0.597 ppm respectively. In the same concern (50) samples of Luncheon were positive for zinc residues with mean value of 0.3839 ppm. Sixteen types of organochlorine pesticide residues (Alfa BHC – Gama BHC – Delta BHC – Heptachlor – Aldrin – Heptachlor epoxide – Endosulfan – Dieldrin – PP.DDE – Endrin – Endosulfan sulfate – PP-DDD – Endosulfan 11 – Endrin aldehyde – PP.DDT – Methoxychlor), were investigated. This study revealed that the residues of PP-DDT were detected in all examined meat product samples. The lowest residues of PP DDT were detected in Frankfurter samples with mean value of 1.69856 ppm, while the highest mean value of PP-DDT was reported in luncheon samples (3.638 ppm). On the other hand methoxychlor residues were recorded in only two meat products (Burger and Luncheon) samples. The methoxychlor residues recorded in luncheon samples was the highest type of detected organochlorines residues (59.02398 ppm) in all examined four types of meat products followed by burger samples (49.66 ppm). Aldrin residue was detected in Frankfurter samples only (0.756 ppm). The same pattern was recorded for Endrin in burger samples (0.716 ppm). The OCP PP.DDD residue was recorded in all examined meat products except in Frankfurter samples. The mean value of PP-DDD in Burger, Luncheon and Sausage were 0.464 ppm, 0.445 ppm and 0.614 ppm respectively. In this study four types of OCP residues were recorded in burger samples whereas three types only were recorded in Luncheon samples. On the other hand, two types of OCP residues were recorded in Frankfurter and Sausage samples.

Key words: Chemical residues, meat products, heavy metals, zeranol, trenbolone, organochlorine pesticides and organophosphate pesticides.