Long Term Freezing Storage Study toward Nutritive Value, Chemical Changes, and Safety of Pistachio Nut

Ghada, Z. A. Soliman¹, Alia M. Hashem¹, Mohamed A. Arafa²
¹ National Nutrition Institute, Cairo; ²Department of Nutrition and Food Sciences, Helwan University, Egypt

ABSTRACT

Introduction: Pistachio (Pistacia vera L.) is one of the most famous and popular nut trees in the world.

Aim of the Work: to assess nutritive value, fatty acid, chemical and sensory parameters, microbiological counts, total aflatoxins & aflatoxin B₁, changes after long term storage in freezer (-18 °C).

Materials and Methods: Twenty samples (raw, unpacked) were collected from the local markets in Egypt. They were subjected to chemical, aflatoxins and microbiological analyses.

Results and Discussion: It was found that pistachios nut become rancid and not safe to be consumed. It was found that fatty acids profile changed after prolonged storage, where saturated fatty acids increased from 5.77 to 13.57 (+3.52 times), and the unsaturated fatty acids decreased from 47.61 to 41.98 (-11.81%). The most decrease was noticed in unsaturated linoleic acid (-57.84%). Also peroxide value increased.

Conclusion: This study has confirmed that prolonged storage render pistachio nuts are a suitable target for deterioration and AF accumulation so prolonged storage must be avoided to reduce deterioration and the threat to human health can be minimised.

Keywords: Pistachio nuts, freezing storage, rancidity, aflatoxins, AFB₁, microbiological contamination.

Protective Effect of *Curcuma longa* or *Nigella sativa* on Aflatoxin B1-Induced Hepato-Toxicity in Rats in Relation to Food Safety on Public Health

**Ghada, Z. A. Soliman*, Alia M. Hashem*, Mohamed Arafa**

*National Nutrition Institute, Cairo; Egypt; **Faculty of Home Economic, Department of Nutrition and Food Sciences, Helwan University.*

**Abstract**

Mycotoxins are naturally occurring substances produced by fungi growing on food and animal feed. Aflatoxins are the most toxic group of mycotoxins, and they are produced by two species of the Aspergillus. Aflatoxin constitutes a real threat to the health of livestock as well as humans. Aflatoxins especially aflatoxin B1 are known to be genotoxic and carcinogenic, can produce acute necrosis, cirrhosis and carcinoma of the liver. *Curcuma longa* (curcumin), *Nigella sativa* (black seed) are extensively used in cousin and in traditional medicines so we tried to investigate their role as hepatoprotective agents from natural products (origin) against AFB1-induced hepatotoxicity in male Sprague-Dawley rats. Eighty male Sprague-Dawley rats weighing 200-239 gm (mean: 215.5±1.27) divided into 4 groups (20 rats each). G1-G2 was fed normal control diet, G3 & G4: fed normal diet supplemented with *Curcuma longa* (curcumin), *Nigella sativa* (black seed) respectively. G2-G3-G4 was given single intraperitoneal injection of AFB1 at the beginning of the experiment. The experiment lasted for 6 weeks. Serum and plasma were subjected to biochemical analysis (ALT, AST, Alk pH, LDH, urea, creatinine, uric acid, total protein, and some immunoglobulin biomarkers as IgG, IgM, and IgA).

The increased levels of serum enzymes (ALT, AST, Alk Ph, and LDH), and urea, creatinine, uric acid, total protein observed in rats treated with AFB1 were greatly reduced in the rats treated with *N. sativa* or *Curcuma longa* along with AFB1. The immunoglobulin biomarkers as IgG, IgM, IgA, were decreased in rats treated with AFB1, but they increased after treatment with *N. sativa* or *Curcuma longa*. These biochemical observations were supported by histopathological examination of liver sections. Treatment with *N. sativa* or *Curcuma longa* along with aflatoxin ameliorates aflatoxin-induced changes in serum parameters.

**Keywords:** aflatoxin, curcumin, serum, creatinine, protein

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Application of Sage Essential Oil as Anti-Food Spoilage Microorganisms in Beef Meat Burger

Asmaa M. A. Khlif¹, Samah M. Esmaeil ¹, Yasser M. Alwy¹ and Mohammed A. Araf².

¹- Home Economics Department, Faculty of Specific Education, Ain Shams University.
²- Nutrition and Food Science Department, Faculty of Home Economics, Helwan University.

Abstract

In vitro study was carried out to evaluate the antimicrobial activity of sage essential oil (SEO) against total aerobic bacteria, total psychrotrophic bacteria, total lipolytic bacteria, total proteolytic bacteria, total mold & yeast, Bacillus cereus, Staphylococcus aureus and Escherichia coli at levels between 0.05 % and 1.0 % (v/w). Gram – negative bacteria as E. coli was less susceptible than gram–positive bacteria as S. aureus. SEO has minimum inhibitory concentration (MIC or bacteriostatic concentration) of 1.0% (v/v) for E. coli and 0.25% (v/v) for S. aureus in vitro, whereas SEO has minimum bactericidal concentration (MBC or bactericidal concentration) of >1.0% (v/v) for E. coli and 0.50% (v/v) for S. aureus in vitro. A higher concentration is needed to achieve the same effect in beef meat burger samples. At concentration of 0.75 % (v/w) SEO significantly reduced the mean value of all investigated microorganisms except E. coli. Regarding to S. aureus, this concentration was adequate to kill all the cells of S. aureus. The results indicate that SEO prolonged the shelf – life of beef meat burger samples from 3 days to 7 days when stored at 4ºC ±1.

Keywords: Sage essential oil, beef burger, meat preservative, food microbiology

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Antimicrobial and Preservative Properties of Oregano Essential Oil in Minced Chicken Meat

Alia M. Hashem¹ and Mohamed A. Arafà²

1- Food Hygiene Department, National Nutrition Institute, Cairo.
2- Nutrition and Food Sciences Department, Helwan University.

Abstract

In vitro study was carried out to evaluate the antimicrobial activity of oregano essential oil (OEO) against total aerobic bacteria, total psychrotrophic bacteria, total lipolytic bacteria, total proteolytic bacteria, total mold & yeast, Bacillus cereus, Staphylococcus aureus, Escherichia coli and Salmonella spp. at levels between 0.25 % and 1.0 % (v/w). Gram – negative bacteria as E. coli was less susceptible than gram–positive bacteria as S. aureus. OEO has minimum inhibitory concentration (MIC or bacteriostatic concentration) of 0.50% (v/v) for E. coli and 0.25% (v/v) for S. aureus in vitro, whereas SEO has minimum bactericidal concentration (MBC or bactericidal concentration) of 0.75% (v/v) for E. coli and 0.50% (v/v) for S. aureus in vitro. A higher concentration is needed to achieve the same effect in chicken meat burger samples. At concentration of 1.00 % (v/w), OEO significantly reduced the mean value of all investigated microorganisms; this concentration was adequate to kill all the cells of Bacillus cereus, Staphylococcus aureus, Escherichia coli and Salmonella spp. The results indicate that OEO prolonged the shelf – life of chicken meat burger samples from 3 days to 7 days when stored at 4°C ±1.

Keywords: Oregano essential oil, Minced chicken meat, Chicken burger
Food preservation, Food microbiology

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Food Safety & Sanitation at Public and Random Areas in Cairo

Alia M. Hashem* and Mohamed A. Arafa**

*National Nutrition Institute and **Nutrition and Food Sciences Department, Helwan University, Cairo, Egypt

ABSTRACT

In the present study, a total of 95 popular ready–to–eat food and beverage samples were collected in surveys from May to July 2011, from different public and random areas in Cairo, Egypt. The vendors were selected because they operated under perceived high-risk conditions with respect to food preparation, holding and serving practices and exhibited a noticeable lack of personal hygiene. Microbiological analyses of all samples were conducted to determine the aerobic bacteria counts, the coliform and *E. coli* counts, the prevalence of *Salmonella* spp, *Bacillus cereus*, *staphylococcus aureus*, and the mold & yeast counts. Food samples only were tested for total aflatoxins detection which were determined in the positive samples by using Elisa technique. The food samples showed unsatisfactory levels of aerobic bacteria, coliforms, *E.coli* and mold & yeast counts in mean of 82.8%, 28%, 21.4% and 50.6% respectively. Also, 5.4%, 24% and 8% of the food samples showed unacceptable contamination of *Salmonella* spp., *B. cereus* and *S. aureus* respectively. Whereas, the juice samples showed unsatisfactory levels of aerobic bacteria, coliforms, *E. coli* and mold & yeast counts in mean of 27%, 53.5%, 46.5% and 23.5% respectively. Also, 10%, 0% and 3.5% of the juice samples showed unacceptable contamination of *Salmonella* spp., *B. cereus* and *S. aureus* respectively. Given the socio-economic importance of street foods, this trend demands actions by the authorities and consumers to improve its safety and to prevent harms to public health. The results of total aflatoxins analyses indicate that total aflatoxins contamination percentage is extremely serious, and possibly result in critical diseases to the customers, since 15% of the food samples contained aflatoxins. In conclusion, the results showed poor hygienic conditions and indicate that, in general terms, the ready-to-eat food types sampled and investigated in this period at these regions posed many microbial hazards to consumers.

Keywords: Food safety, hygiene & sanitation; Ready–to–eat food & beverage; Microbiological quality; Aflatoxins; Microbiological hazards

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