Mikrobiologická kvalita některé pernaté zvěře prodávané na egyptských trzích
Microbiological quality of some game birds sold at Egyptian markets

Mansour, H. A., Roushdy, S.A., Ibrahim, A.M.
Oddělení hygieny a kontroly potravin
Fakulta veterinární medicíny, Káhirská univerzita

Introduction

Game birds are wild birds that are permitted to be hunted for food during certain seasons and in accordance with regulations. Game birds, a cost-effective alternative to domestic chickens, offer protein and unique flavors, making them a popular addition to diets worldwide. In Egypt, doves and sparrows are from the most common game birds used as food, which being sold defeathered and uneviscerated (New-York dressed). Compared to farmed meat animals, warm, newly killed game needs more immediate treatment to bleeding, evisceration, and freezing; otherwise, it may become damaged or even spoiled **(Gill 2007).** Nevertheless, game birds were subjected to a variety of pre-mortem stressors, such as bad weather, exhaustion, etc., resulted in the loss of muscle glycogen, which altered the final pH and decreased the quality of the meat and its shelf life **(Yassien *et al.*, 1991).** Additionally, the ante-mortem stressors increase the gut's permeability to bacteria, which causes the tissues to decompose.

Objectives

In order to assess the microbiological quality of sparrows and doves sold at Egyptian markets, some important microbiological counts will be evaluated in this study.

Methodology

Eighty game birds (40 each of doves and sparrows) were collected aseptically and separately from Egyptian markets. Then samples were transferred directly to the Laboratory of Food Hygiene and Control Department, Cairo University. Ten grams of each bird were weighed aseptically in a sterile polyethylene bag to which 90 ml of sterile Ringer's solution was added and homogenized. Tenfold serial dilutions were prepared to determine the microbiological counts. **Aerobic mesophilic bacterial count (MC)** and **psychrotrophic count (PC**) were evaluated according to the technique recommended by **Ryser & Schuman (2015)** and **Cousin *et al.* (1992),** respectively. **Pseudomonas-aeromonas counts** were adopted as described by **Kielwein (1969)**. The technique described by **Cruickshank *et al.* (1975)** was applied to detect **yeast and mould count.** Finally, for **coliforms**, the MPN technique with the three-tube method was followed as recommended by **APHA (1992).**

Results

Table 1: Aerobic plate count (cfu/g) in the examined game birds.

Species	No.	No. of Positive samples	%	Minimum	Maximum	Mean	± SEM
Sparrow	40	40	100	2×10^5	6.2×10^7	5.1×10^6	2.1×10^6
Dove	40	40	100	2×10^4	2×10^7	2.4×10^6	8.3×10^5

Table 2: Psychrotrophic count (cfu / g) in the examined game birds.

Species	No.	No. of Positive samples	%	Minimum	Maximum	Mean	± SEM
Sparrow	40	40	100	7×10^4	2.4×10^7	4.6×10^6	1.4×10^6
Dove	40	36	90	8×10^3	6.4×10^6	5.2×10^5	2.6×10^5

Table 3: Pseudomonas count (cfu /g) in the examined game birds.

Species	No.	No. of Positive samples	%	Minimum	Maximum	Mean	± SEM
Sparrow	40	37	92.5	2×10^3	2.2×10^7	3.5×10^6	1.1×10^6
Dove	40	26	65	2×10^3	3.4×10^6	3.2×10^5	1.8×10^5

Table 4: Aeromonas count (cfu /g) in the examined game birds.

Species	No.	No. of Positive samples	%	Minimum	Maximum	Mean	± SEM
Sparrow	40	20	50	2×10^3	2×10^6	4.9×10^5	1.7×10^5
Dove	40	9	22.5	10^3	4×10^4	7.6×10^3	5.9×10^3

Table 5: Total yeast count (cfu /g) in the examined game birds.

Species	No.	No. of Positive samples	%	Minimum	Maximum	Mean	± SEM
Sparrow	40	40	100	2×10^4	9.6×10^7	10^7	4.1×10^6
Dove	40	37	92.5	3×10^4	2.4×10^7	3.1×10^6	9.7×10^5

Table 6: Total mould count (cfu /g) in the examined game birds.

Species	No.	No. of Positive samples	%	Minimum	Maximum	Mean	± SEM
Sparrow	40	33	82.5	2×10^3	4×10^6	5.6×10^5	2.4×10^5
Dove	40	33	82.5	2×10^2	3×10^5	6.3×10^4	1.6×10^4

Table 7: Coliforms count (MPN/g) in the examined game birds.

Species	No.	No. of Positive samples	%	Minimum	Maximum	Mean	± SEM
Sparrow	40	40	100	7.5×10^2	2.4×10^4	9.9×10^3	2.3×10^3
Dove	40	40	100	0.23×10^2	1.1×10^4	4.5×10^3	1.3×10^3

Conclusion

The results of our study indicated that game meat at Egyptian markets might pose a risk to consumers and how crucial it is to regulate and oversee the sanitary conditions used for game bird hunting, processing, storage, and sale.

References

A.P.H.A. "American Public Health Association" 1992.Compendium of Methods for the Microbiological Examination of foods, 3rd Ed. Washington, DC, USA. Berlin, 7-12-7.

Cousin, M. A., Jay, J. M., & Vasavada, P. C. 1992. Psychrotrophic microorganisms. Compendium of methods for the microbiological examination of foods, 3(1), pp.153-165.

Cruickshank, R., Duguid, J.P., Swain, R.H. A. 1975. Medical Microbiology, 12" Ed. vol. 2, E.S. Living stone Limited, Edinburg, London and New York.

Gill, CO. 2007. Microbiological conditions of meats from large game animals and birds. Meat Sci vol.77, pp. 149–160. doi: 10.1016/j. meat sci. 2007.03.007.

Kielwein, G. 1969. Nutrient medium for the selective cultivation of pseudomonads and aeromonads. pp. 131-133.

Ryser, E. T., & Schuman, J. D. 2015. Mesophilic Aerobic Plate Count. In Y.Salfinger, & M. L. Tortorello, (Eds.). Compendium of Methods for the MicrobioLogical Examination of Foods (5th ed), chapter 8, pp. 95-102.

Yassien, N.A., Darwish, A.M., El-Sherif, A.M., El-Daly, E. 1991.Foodborne fungi in sparrows. Vet. Med. J. Giza vol.39, no.2, pp. 201.

Contact address

Prof, Dr.Hayam Abdel Aal Mansour Ph.D., Cairo University, Faculty of Veterinary Medicine, Department of Food Hygiene and control, Giza, Egypt,
Email:hayamoustafa@cu.edu.eg